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Bovine Tuberculosis and the Value of Routine Herd Inspections

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Mr. Steward, recently, in the *Veterinary Record*[1] made an excellent survey of county local authority work as shown in the annual reports of several veterinary officers. I, in a paper[2] to the Congress of the Royal Sanitary Institute, 1937, made a similar survey of my own experiences in two counties and therefore appreciate fully the difficulties met by Mr. Steward. I agree with him in regard to the awkward variation in the type of the reports and the inclusion of unimportant material. In the case of my own for 1935, he was handicapped in that certain important figures were included in the report of the County Bacteriologist, and, as both were part of the report of the County Medical Officer of Health, I avoided repetition. These were that 3,011 microscopical examinations of milk and sputa were carried out by the County Bacteriologist on behalf of the Veterinary Department. Also, in Staffordshire, private veterinary surgeons, at the request of "Accredited" producers, inspect a considerable number of herds, the county council giving free service in respect of microscopic and biological examinations of samples from suspected cows, approximately 330 of the former being made during 1935. Therefore a proportion of the 790 cows given in Mr. Steward's paper as slaughtered following reports by owners and private veterinary surgeons would be detected during herd inspections. He completes his survey with six valuable conclusions, but on studying his remarks and tables, especially No. II, I think he has ignored points in the various reports when asserting that—"(3) the best results occur where the microscopic examination of samples is carried out by the veterinary officers concerned with the clinical examinations."

He makes no attempt to explain why Staffordshire is in the top six of Table I and also has the highest number of tuberculous udders per 10,000 examined and yet no laboratory duties are carried out by the veterinary staff, whereas the neighbouring county of Cheshire, where the veterinary officers do their own microscopic examinations, is eleventh. I consider, however, that these two counties, using different methods, are suitable for comparison, as the results in both for tuberculous udders per 10,000 cows examined are identical, *viz.*, 37. (*N.B.*—Mr. Steward gives the figure for Cheshire as 30, but from the figures below it should be 37—identical with Staffordshire.)

The essential figures for the two counties, abstracted from Mr. Steward's paper, are:—

	Cheshire	Staffordshire.
Staff	11	7
Number of cows examined, M. & D. and M. (S.D.) Orders	144,026	138,268
Microscopic examinations	3,567	3,011
Tuberculous cows detected on routine inspection...	348	788
Tuberculous cows detected per 10,000 examined on routine inspection	24	57
Total of tuberculous udders... ...	529	509
Total tuberculous udders per 10,000 cows of total cows examined ...	37	37

The conditions with regard to the average size of herds, handling, rearing and purchase of stock, climate, contours, etc., are probably very similar, except that Staffordshire has a larger area of hill ground, where herds are more or less self-contained.

Mr. Steward rightly devotes one column to "Other Duties" of whole-time veterinary officers, and in this respect Cheshire and Staffordshire are identical in that in both the only work performed by the Veterinary Departments under the Diseases of Animals Acts is all duties under the Tuberculosis Order of 1925, but both are the executive departments for county council duties under the Milk (Special Designations) Order, as regards sampling, methods, buildings, etc. These latter duties are not mentioned in Mr. Steward's paper and are probably more onerous than most work credited to other counties.

As I point out below, the most important index figure as to the value of routine herd inspections is the comparative number of cases of tuberculous mastitis detected, and it appears

that the two Departments have achieved similar results by different methods, material conditions being the same. The veterinary staff in Cheshire is eleven, Staffordshire, seven, but against this in the latter case must be placed the work done at the county laboratory. There is a considerable difference in favour of Staffordshire in the number of cows detected at routine herd inspections, but it should be noted that in 1935, routine herd inspections had been made in Cheshire for several years, whereas in Staffordshire, the first series were not completed until about June, 1935, and obvious clinical cases (especially "emaciation" and "chronic cough") are fewer after the first year. On the other hand, owing to out-of-date district council registers, much time during 1935 was spent in searching out farms from day to day and organising districts.

Also, in Staffordshire, I have been fortunate in having available a larger supply of guinea-pigs than the average, and, since the inception of the Veterinary Department, have always arranged that all supplies surplus to the requirements for herd inspections were used to the fullest advantage by sampling herds between inspections and gradually developing a system of "group herd" sampling, as laboratory accommodation was extended. When possible, this was directed to cover herds with bad histories or noted specially at herd inspections.

I do not think it is necessary to pursue comparisons further, Mr. Kerr and I having followed the same essential lines except in the matter of microscopic examinations, but there is a complete county laboratory in Stafford, and it was quite possible that, if our positions had been reversed, we would have adopted the methods of the other. The main point is that microscopic examinations made by the veterinary officers examining the cows is not essential to *comparative* success. Any veterinary officer organising a Veterinary Department must consider and make the fullest use of all existing local authority facilities available to him. Bacteriologists, if necessary, must study methods of improving technique to reduce the percentage of positive samples missed by the microscope as has been reported by M. L. C. Maitland.[3]

In China, Newcastle-on-Tyne, and for my first year or two in Dumfries, I did my own microscopic examinations; then Mr. Sangster and I, through the courtesy and help of Dr. Armstrong, County Bacteriologist, Dumfries, developed a system approaching the ideal, where all work, including examinations, was done in the laboratory, but all positives, and any specially marked negatives, were left for a further examination by us if we wished. I may say that we became so used to Dr. Armstrong's system of reporting on each slide that latterly we appeared only to examine those demonstrating something unusual or acid-fast organisms not morphologically *M. tuberculosis*. In Staffordshire, with a complete organisation behind us, all work is carried out at the county laboratory by Dr. Menton and his staff. On the other hand, had I not this service available here, I would have given serious consideration to developing a central laboratory, ultimately to be extended to carry out biological, pathological and milk bacteriological examinations. Such a fully equipped local service is essential to a successful campaign against disease and, both here and in Dumfries, I have always been able to submit for the fullest examination all types of samples and *post-mortem* specimens, with invaluable help to practitioners, owners and ourselves. It should be noted that the preparation of slides can be entrusted to trained laboratory assistants, just as a sufficient clerical staff allows veterinary officers to spend more time in the field.

Mr. Steward raises a very important point when he states that a veterinary officer performing his own microscopic examinations must cut short his time in the field compared with the one who does not and therefore examines more cows to complete a reasonable day's work. He (Mr. Steward) has missed, however, the main advantage, one which should also have been included in his "conclusions." It is that the period during which cows are examined can be reduced to that when the udders are reasonably empty. In Staffordshire, milking finishes 7.30 a.m. to 9.30 a.m. and 4.30 p.m. to 7.30 p.m., therefore herd inspections are arranged from 8 a.m. to 12 noon during winter and 8 a.m. to 10.30 a.m. and 4.30 p.m. to 7.30 p.m. during summer, all other work such as clerical, tuberculosis reports, post-mortems and duties under the Milk (Special Designations) Orders, being performed at other times. The advantage claimed by Mr. Steward was that it relieved the monotony and strain of examining cows, but personally, though interested in and having done a fair amount of laboratory work, I have found the daily examination of milk samples more monotonous and tiresome than clinical observation, though I suppose this is an individual problem. I am afraid that, in the past, when having to examine my own samples, on many mornings when suspicious cows were rather numerous, I was inclined to rely on clinical observation and restrict the number taken—perhaps, of course, I am the lax exception. Certainly where sampling of all cows examined is carried out there is a check six weeks later. A study of many annual reports shows a close similarity between the positive samples and the cows slaughtered and one must question the value of our training and clinical experience. We all know, of course, the feeling of superior confidence engendered by a positive sample when about to make a *post-mortem* examination,

attended by a doubtful owner. Many animals of a lower value do not warrant the time and money often spent on their diagnosis.

Some of the following personal opinions of our work are almost the direct opposite to what I have held in the past. I now regret that I have not been able, owing to more than ample field work and administrative duties, to keep the statistics I would have liked, yet my remarks are the outcome of fairly extensive opportunities for observation.

Tuberculous Mastitis

As stated in annual reports and my paper to the Royal Sanitary Institute Congress, I consider the origin of 90 per cent. of such cases to be infected milk, and that infection of the portal lymph glands and/or liver plays a very important part. An examination of the post-mortems for Dumfriesshire showed that in at least 70 to 80 per cent. of cases the latter were affected and the reports of the veterinary officers for Staffordshire, though not yet abstracted, show similar, if not higher, results. A close study of the actual *post-mortem* lesions in both cows and heifers of all ages supports my remarks as regards origin, as do histories of cases, where obtainable with any degree of accuracy. With regard to hepatic infection, it is usual to find it in cases of tuberculous mastitis where the only other lesion is a very limited and apparently non-active infection in one or two mesenteric lymph glands. Jones, Torrance and other writers on meat inspection have noted the unusual distribution of tuberculous lesions where the liver is affected. The udder can be, and is affected, in generalised cases where the primary lesions may have been pulmonary, but the mastitis in the majority of these is miliary or rapidly progressive and the period during which milk is included in that being sold, or fed to calves, comparatively short. Pulmonary cases lead, in the main, to others similar in type. There is also a class which is described as "generalised" but in which a close *post-mortem* study shows a very limited infection of the substance of the lungs and associated glands but extensive infection of the peritoneum, all abdominal organs, pleura and probably the udder. I think the pleural infection is due to direct spread from the abdomen *via* the lymphatic system, the posterior third of the pleura being drained through the diaphragm into the portal system. One must, however, in implicating the portal lymph glands draw attention to a recent paper by Nieberle[4] in which he, from direct experiments in feeding, states that a primary isolated portal lesion points to congenital placental infection. I cannot recollect a case of tuberculous mastitis in which the only other lesions observed were in the portal glands, but one wonders if uterine infection of calves is commoner than suspected. It should be noted that in some Continental countries uterine tuberculosis is scheduled and examined for extensively. Infected sputum, faeces and urine only account for a very small proportion of infected bulk samples of milk, and, as contamination is very intermittent, these sources have no important public health aspect. Therefore, elimination of infection in milk depends almost entirely on the non-infected feeding of heifer calves which would reduce tuberculous mastitis and metritis. I have shown elsewhere[2] the falling incidence of tuberculous mastitis and positive milk samples in Dumfries since 1929 but both Sangster and myself know that this is not essentially due to the slaughter of variously affected cows as, owing to other duties, our herd inspections averaged not many more than one per annum. We always stressed, however, the importance of feeding calves from the youngest cows with no visible induration of any quarter of the udder, even though a history pointed to a streptococcal mastitis or even injury. Also we often pursuaded owners to test a few of their youngest cows and keep the milk from non-reactors for calf feeding. This may seem contrary to the interests of consumers generally but it is the only way to break a vicious circle and has been justified by results. It is a startling statement to make, but bulk sampling by boroughs, especially where supplies come from areas not supervised by routine herd inspection, has probably led to an increase in tuberculous udders. We all know that many farmers, when they observe a suspicious udder, keep the milk from that cow for calf or pig feeding and so avoid a positive report on their supply, with a subsequent herd examination.

The following are a few general observations on tuberculous mastitis, sampling, etc. The "text-book" type of tuberculous udder is seldom seen clinically or at a *post-mortem*. Therefore diagnosis depends on consideration of history, general symptoms, and detailed examination of udder and supramammary glands. The pre-clinical or acute stage of the disease will give definite microscopic results. All quarters should always be sampled in a suspicious case, especially that on the same side as the indurated one, as often a new focus of infection may be commencing with more abundant bacilli in the sample. More work is desirable on the pathogenicity of samples in which acid-fast bacilli, morphologically tuberculous, are demonstrated microscopically. We, in Staffordshire, have submitted to the biological test samples from cows reported positive microscopically and in a considerable percentage have received negative reports. Secretion of bacilli may be intermittent, depending probably on the stage of development of the udder lesions when the sample is taken. Many cows will show a definite induration and yet, when re-examined six to eight weeks later, after receipt of a positive report, it is almost

impossible to tell the affected quarter—does this mean that there has been a certain degree of recovery? In other cases it is often very difficult to demonstrate at *post-mortem* the lesions which were very definite clinically. These types of cases we usually confirm with *post-mortem* specimens of udder and milk. We have often ignored a negative result, both microscopical and biological, and slaughtered the cow on clinical evidence, the *post-mortem* being definitely positive. It is not clear whether it is in the fore-milk, middle milk or "strippings" that the most bacilli can be demonstrated, but, if inspections are carried out immediately after milking, only the last, with a high butter fat content, is available. The quantity of milk taken, and dilution, would appear to have some effect on the development of tuberculosis in the guinea-pig, as, on one or two occasions, the milk from a suspicious cow, sampled individually, has been included in error in a bulk from other cows, the single being positive and the bulk negative.

There is of course a pre-clinical stage in the development of tuberculous mastitis, probably very active and dangerous, with secretion of abundant bacilli. Therefore routine inspections, to be complete, must be combined with bulk sampling from all apparently healthy cows.

The sediments of bulks from one or more farms with good histories may be grouped and injected into one guinea-pig, each being centrifuged separately. The group should be limited to a total of 40 to 60 cows to allow for reasonably accurate results and also convenience in re-examining positive groups. I have found that an allowance of 50 guinea-pigs per 100 herds examined is sufficient to cover the original inspections and the re-examination of positive groups, including all single samples from suspicious cows. Inoculation of two guinea-pigs from each sample is an improvement, but the available supply of animals must always be used to give maximum results. A great benefit from double inoculation, in addition to more accurate results, is the saving in not having to repeat a sample when one guinea-pig dies (especially if from a group of herds).

Tuberculous Emaciation

The majority of cases in this group can be classed conveniently as either tuberculous mastitis or pulmonary tuberculosis, though a few may be due to tuberculous peritonitis without obvious symptoms of either. The emaciation in a large number of cases is due, I think, to diseases other than any tuberculous lesions found at *post-mortem*, *e.g.*, Johne's, parasitics, etc.

Pulmonary Tuberculosis

This is the most extensive type in adult cattle and may be prevalent in young stock on some farms, when reared under certain conditions. Spread of the disease takes place essentially by more or less direct contact in the cowsheds during winter months. Feeding, especially of milk to young stock, has no particular significance in these cases. If one traces the history of store stock found with primary or extensive pulmonary tuberculosis, there is the almost invariable history that they have been tied in sheds with adult cattle or kept as calves in feeding passages. Development of the disease is mainly pulmonary, with or without mesenteric infection from swallowed sputum, until there is a breakdown of a lesion followed by generalised or miliary tuberculosis with a fairly rapid termination, the period during which infected milk may be secreted being comparatively short. Therefore the public health aspect of eradication of these cases is insignificant. What is the economic agricultural one in relation to routine inspection, including examination of sputa? I have come to the conclusion that its value is doubtful and attempted partial eradication by these methods does not justify the expense. It was about ten years ago that Sangster and myself first commenced using, to any great extent, sputa as a means of diagnosis, and both were very enthusiastic about anticipated results. We made probably the first attempts in this country to collect, as a routine procedure, expectorate direct from the cows, having had made two specially long forceps with a curve, intending to swab the larynx. For various reasons the idea was a failure, and, sometime after my forceps had "disappeared" from my car, I observed them being used successfully by a practitioner friend in a "pupping" case! In Staffordshire, the instruments, sputum cup and tracheal swabs, used on the Continent, have been experimented with, when—an important point—the owner has agreed. The staff have always been allowed freedom as regards the collection of sputa, and the laboratory welcome them in preference to milk samples, but I doubt the value of taking much trouble over obtaining specimens. Diagnosis based on sputa collected from walls, etc., requires much care. In Dumfriesshire collection on smooth walls was easy and one could be fairly certain of its origin, but it is the reverse in a county such as Stafford with its hay racks, frequent changes of cows, etc., and unless there is other fairly conclusive clinical evidence, a repeat of a recent specimen is advisable. Removal of pulmonary cases probably only leads to a varying, and possibly temporary, reduction in the amount of gross infection. Two points must be remembered; the first, that a solitary lesion, the size of a pea, adjacent to an air passage, will give a positive sputum, and second, that at the time of our inspection no sputum is available from, or clinical evidence observed in, the majority

of the pulmonary cases then present in the herds. Therefore we usually leave cows in which the disease is further advanced and which are often of less value than those slaughtered.

Torrance, at a recent meeting gave an interesting commentary and demonstration on the use of the phonendoscope and I agree with his observations, the main point being that the more râles you hear, especially if distributed more or less evenly over the lungs, the less likely is the case to be tuberculous. A similar generalisation may be made with regard to sputa, *viz.*, the more copious and free the specimen, the fewer the positive results, whereas 90 per cent. of greyish or yellow specimens, about the size of a lentil or a pea, are positive. These observations agree with the average type of tuberculous lesion.

Intensive, direct collection of sputa and examination by both microscopical and biological methods under the Ostertag Scheme have been practised for several years on certain parts of the Continent (*vide* Brook[5]) and the results from south-east Germany for 1919 to 1934 show that very early eradication of pulmonary cases has led to only a limited reduction of these cases and has had no effect on the incidence of mammary and uterine tuberculosis. In Dumfriesshire we observed that, even in more or less self-contained herds, there was no material difference from year to year in the number of pulmonary cases taken from herds with a high incidence of pulmonary tuberculosis unless the owners adopted the general advice we gave on other points.

The position is probably the same in Ayrshire, Lanarkshire and other counties where routine inspection has been carried on for some years. The most that can be claimed in such cases is that affected animals have been removed before obvious clinical symptoms and depreciation have appeared. The position must therefore be much more uncertain in the "flying" herds of the Midlands of England. Where a cow is slaughtered following a positive sputum and a solitary, small, active lesion found in the lung substances, it is probable that there would have been partial recovery with comparatively harmless calcification and no further development for a considerable period, such lesions being observed often at *post-mortem*.

I have seen a few cases where a positive sputum was probably due to a ruptured retropharyngeal lymph gland and, in the majority of pulmonary cases, tuberculous ulcers, with an opening into the trachea, will be found under the mucous membrane at the junction of the cartilages on the ventral aspect of the trachea.

Infected pastures apparently play only a small part in dissemination, as has been noted by E. C. G. Maddock,[6] though stock from herds which have been free for one or more generations will probably be very susceptible to such infection, and also to that in transports, improperly disinfected stalls, markets, etc. Examination of lesions giving a positive sputum often shows a very recent, but acute, origin and such may often have been the cause of a breakdown in a herd tested at too long intervals.

Reference to the value of tuberculin tests is not necessary in this paper, but the results of first tests on heavily infected herds, such as are found in Staffordshire, confirm many of the above points on dissemination. A common result is 5 per cent. or less reactors in young stock, if not in contact with the milking herd, with 70 per cent. to 100 per cent. amongst the latter and if these are grouped according to age the percentage rises with each successive winter tied in the sheds. Where any considerable number of reactors are found in the young stock, they are usually found in age groups and there is a history of calves being fed from suspicious cows. Where there is an even distribution of reactors through the whole herd, including young stock, one usually finds close contact of the latter with the adult stock at some part of the rearing. Where further testing and proper rearing methods are adopted eradication follows the usual course, though it is interesting to note that practically all non-reactors out of originally heavily infected sheds or groups, will ultimately react during the next one or two years, which may point to a latent period between exposure to infection and the development of lesions sufficient to give a reaction. The latter point is rather indicative of the impossibility of making any material headway by clinical methods. Construction of buildings plays an important part in checking the spread of infection; the position in the south-west of Scotland at present can be credited partly to this. The sheds in this area are generally free from woodwork, feeding passages, lofts and have good lighting and ventilation. I am afraid much of the reconstruction rushed through in England during the past two years will not give the desired results owing to faulty design. I believe ventilation or ample cubic capacity is the most important factor in checking spread, both by dilution of infection and by keeping humidity at normal levels, which is essential in avoiding pulmonary complications. There is no doubt that infected stall fittings, difficult to disinfect, have led to reactors in tested herds.

Tuberculosis Order, 1925

Those responsible for the drafting of this Order must be congratulated in that, though there was little previous information available to base it on, it has served a useful purpose for twelve years with only two minor amendments. Much of the criticism passed should be

levelled, not against the powers contained in it, but against the manner in which they have been used or interpreted. I personally have always had the fullest support from the officers of the Ministry in dealing with all open cases of tuberculosis and, though difficulties do occur with regard to valuation and compensation, they are not insurmountable. As an instrument of partial and temporary protection to public health, it has been invaluable. The low number of tuberculous samples in Dumfriesshire is partly due to it, there being 6 per cent. to 9 per cent. positive reports from boroughs during the years 1926-1929 but only a total of eight reports from 1931 to 1936 though the total number of samples examined has probably increased. The Chief Veterinary Officer, West Riding, states[2] that 3·8 per cent. bulk samples taken in his county are positive as against the average of 10 per cent. for the country generally. In my annual report for 1935 I state that no material difference can be expected in bulk supplies until approximately three years after the commencement of routine herd inspections to allow young stock, reared on milk with reduced infection, to calve and join the milking herds. In Staffordshire an average of two thousand to three thousand "street" samples for biological examination have been taken annually. During the three years previous to the commencement of herd inspections in October, 1934, the average positive results were 10·3 per cent., from then until the end of 1936 9·3 per cent. and for the first three-quarters of 1937, 4·5 per cent., 4·3 per cent. and 4·8 per cent. Since 1934, of course, street sampling has been directed to a certain extent against known suspicious supplies. With complete "group sampling" of the whole county, as intended during 1938, these last figures would, I think, be reduced about 50 per cent., any further fall depending on the rearing of young stock within, and the improvement of importations into, the county.

The Order has been of great educational value both to the veterinary profession and owners and, in this respect, I doubt if the fullest use has been made of it. I have always arranged that post-mortems have been carried out at as many convenient points as has been consistent with economy and, if possible, demonstrated the origin and progress of the tuberculous lesions and any other diseases observed. The tuberculin test, as a means of diagnosis under the Order, is almost valueless, except in a county such as Dumfries, where one may expect a reaonable number of negative results but, by testing proved open cases, one can gain considerable experience in interpreting reactions and comparing methods of technique and types of tuberculin. The Order has a definite value in surveying the gross infection of an area when routine herd inspections are commenced pending further advance through the tuberculin test.

The opinion was expressed recently that compensation for diseased animals should be paid for a limited period only. If this is correct, when should compensation for clinical or open cases cease? It is a thorny problem, but if my observations given above are correct, the operation of the Order could be restricted to animals proved to be suffering from tuberculous mastitis or excreting *M. tuberculosis* in their milk and, owing to recent developments, its scope extended to include goats. The question then arises as to whether such cases should be branded and moved under licence at the owner's risk to a slaughterhouse, or whether the procedure should be similar to that contained in the present Order. Many not connected with agriculture would demand the first, but there are sound arguments which make the latter advisable and just.

Tuberculin Testing

I shall refer to tuberculin testing only in connection with heavily infected self-contained herds and areas. Its application to these will give as valuable, and almost as rapid, results as to those comparatively free provided the annual number of calves reared is equivalent to 25 per cent. to 40 per cent. of the milch cows and there is no apparent risk of complications from contagious abortion. The main essentials are the feeding of the calves from non-reacting cows, the regular testing of all young stock and their isolation from adult stock, the calving heifers being tied together in previously disinfected stalls in separate sheds or at the top end of a shed, the original herd being grouped together and gradually eliminated as each batch of heifers calve. Separate grazing is desirable but not essential at this preliminary stage. It has been my experience that, if these methods are followed, at the end of two-and-a-half to four years the percentage of reactors in the "new herd," which, of course, is tested regularly with the young stock, will be sufficiently low to allow disposal of all reactors without any great disorganisation of milk supplies, etc.

As I mentioned in my reports for 1935 and 1936, there are "short cuts" pending the increase of free home-reared cattle and, of course, the usual precautions must be taken as regards fencing, etc. It is difficult of course to persuade the average owner of a heavily infected herd to make a start, as at present his prospects of extra income are rather remote. When inspecting herds with a large number of "followers" reared on the milk from any cow, I often feel my visit would be more valuable if, in addition to the clinical examination, I injected with tuberculin a few of the youngest cows, a re-visit at the end of 72 hours being

sufficient to find one or two suitable for calf feeding.

Vaccination Against Tuberculosis

When I first had experience of heavily infected herds I felt that vaccination was the only solution, but our knowledge of its application in the field is still in the experimental stage. A very important point is that vaccinated calves, for a certain period, must be handled under the same conditions necessary for successful eradication by the tuberculin test and, therefore, its application to heavily infected herds is as difficult a problem as proceeding with the tuberculin test.

The success of any scheme must depend largely on the co-operation of the stock owners who might be regarded as lay assistants, under remote control, in what is scientific work. When we consider that we, ourselves, are often puzzled by results is it surprising that there are many breakdowns?

Conclusions

(1) Microscopic examination of samples by the veterinary officer examining the cows is not essential to the success of routine clinical examination of herds.

(2) Examination of udders should be limited to a period of about four hours after milking.

(3) It is doubtful if clinical inspection and examination of sputa have much effect on the incidence of pulmonary tuberculosis.

(4) Infection in bulk supplies is not reduced to any appreciable extent by the slaughter of pulmonary cases.

(5) Clinical inspection with early removal of cases of tuberculous mastitis does effect an improvement in the milk supplies and reduces infection in young stock.

(6) "Group bulk sampling" of herds at the time of inspection is a valuable and necessary adjunct to clinical examination.

(7) Eradication in heavily infected self-contained herds can be effected in two to four years by feeding calves on milk from non-reacting cows, all tested stock being isolated completely or partially from the original herd, particularly in the sheds.

(8) It is possible that neither agriculture nor public health would be affected seriously if slaughter was limited to cases of tuberculous mastitis.

References

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APPENDIX

Since the completion of the above paper, I have read with great interest and gain that by Torrance on "The Paths of Infection in Udder Tuberculosis" in the *Veterinary Record*, published November 13th, 1937. Some of the opinions expressed, like my own above, will be criticised, but they are based on direct observations, and the section dealing with the examination of the suprammary lymph gland is a valuable clinical contribution. I agree with him in regard to the presence of macroscopic lesions in the supramammary lymph gland with no visible tuberculosis in the udder and that the lower third of the quarter towards the base of the teat is a common site of the first visible induration in tuberculous mastitis. There also appears to be a chain of very small subcutaneous lymphatics on the posterior medial aspect of the udder, which, when palpable, give a strong indication of tuberculous mastitis. I have observed the following point about the enlarged supramammary lymph glands with the convex cut surface, described by him. It is that, in addition to the usual change in the texture and appearance of the gland, there may be one or more dull red areas which, I assume, are evidence of commencing activity and the precursor of caseation and calcification, the general change in the gland being due to the absorption of toxins. These areas appear also in otherwise apparently normal glands but which, according to other lesions in the carcase or offal, are possibly infected. They are to be differentiated from the acute type, usually extensive and peripheral, associated with acute or miliary forms of the disease. I have submitted on several occasions, both here and in Dumfries, specimens of such glands for microscopic examination only, especially from the portal and supramammary lymph glands and a number have been reported as showing acid-fast bacilli. Recently, however, I decided to arrange for the laboratory to carry out a complete examination of a few such glands showing only dull red areas and this week I have received the first biological results of specimens from two calves, the histories and post-mortems of which I give, as they are fairly complete and have a distinct bearing on the opinions expressed above.

Herd.—Pedigreed, milk recorded and tuberculin tested. Had been tested for at least seven years and now self-supporting with occasional breeding purchases from attested herds, but originally built up by purchases. No reactors in the herd since early in 1934 and that a newly purchased cow which was not admitted to the herd but isolated.

All the herd, down to three-months-old calves, tested September, 1937, and all passed except five calves reared on the premises; these were out of about eight born during January and

February this year (1937). I enquired into the possible origin and arranged with the owner and his veterinary surgeon to check test, with bovine and avian tuberculin, two of the five heifer calves as there was contact with a few old game cocks. The results of the test pointed definitely to a bovine infection. The owner decided to have these two slaughtered in preference to selling them as he had done with the other three. I arranged to make *post-mortem* examinations and the following are the results with laboratory reports of glands submitted.

Larger Calf.	*Post-mortem* Examination.	Micro-scopical.	Biological.
Retropharyngeal gland	Enlarged and cloudy	Positive	Positive
Mesenteric glands	Two to three calcified or cloudy		
Mediastinal gland	Slightly cloudy	Negative	Not done
Portal glands	Dull red areas	Negative	Positive
Liver	Small areas of congestion		
Lung	Small areas of congestion	Negative	Not done
Supramammary glands	Dull red area in one gland	Negative	Tubercles seen only on spleen, and acid-fast bacilli recovered
Smaller Calf			
Mediastinal lymph glands	Slight cloudiness	Negative	Not done
Mesenteric glands	Calcified or cloudy	Positive	Positive
Hepatic lymph gland	Very slight dull red area	Negative	Negative
Suprammary glands	Very slight dull red area in one gland	Negative	With supra-mammary from larger heifer

No other *post-mortem* symptoms were observed. I carried out the *post-mortem* examinations myself with my own knives in such a manner as to avoid cross contamination between glands. Since making the *post-mortem* examinations further detailed enquiries revealed a definite source of infection from milk. Typing of the organisms is not yet completed.

The fight against the menace of the musk rat, an animal which is a danger to embankments and does considerable damage to crops and fish, has ended to all appearances in complete success, states the report of the Ministry of Agriculture and Fisheries on the work of the land division during 1936.

The Detection of the Cow Suffering from Udder Tuberculosis

H. L. TORRANCE, M.R.C.V.S., D.V.S.M. (VICT.), County Veterinary Officer, Nottinghamshire.

Within recent years there has been a very marked increase in the number of local authorities who have adopted routine veterinary examination of dairy herds as an integral part of local government administration, and as it is proposed under the Agriculture Act of 1937 to increase the practice by making it applicable uniformly throughout the country, the present time would seem an appropriate one to examine the subject with a view to determining its true value, and to consider whether any steps could be adopted to increase its efficacy.

Since the power to carry out routine clinical examination of dairy herds is contained in enactments of the Ministry of Health, it is reasonable to assume that the measure was introduced primarily as a means of protecting the public from the dangers of milk infected from a bovine source, with special reference to tuberculosis, and not as a means to reduce the incidence of bovine tuberculosis.

Although the Tuberculosis Order was introduced by the Ministry of Agriculture and Fisheries, its chief object would appear to be to enable local authorities to slaughter cows, detected by their veterinary officers under the Milk and Dairies Acts and Orders, which are considered to be a menace to public health. Prior to the introduction of the first Tuberculosis Order in 1913, local authorities who had obtained special local powers for the detection of cows suffering from udder tuberculosis had no power to compel the slaughter of such animals. This obviously intolerable position impelled local authorities in possession of these powers to importune the Government to give them power to slaughter these animals, and as a result of their efforts the first Tuberculosis Order eventually came into being. The Tuberculosis Order of 1925, embodying the same general principles as the early Order, may therefore be regarded as essentially a public health provision. In fact, unless it is so regarded and considered as complementary to the Milk and Dairies Acts and Orders, it would appear to be practically worthless and a waste of public money as a means of dealing with the problem of bovine tuberculosis.

Since any cow affected with tuberculosis in any degree is a potential source of danger to the public health, the object of routine veterinary inspection should logically be the detection of every clinical case of tuberculosis. Of all such clinical cases, however, the most

dangerous to man is that affecting the udder, and therefore the value of routine inspection as a public health measure depends almost entirely on the number of these cases that can be detected by that procedure. As the object of this article is to consider the value of routine inspection more particularly from the public health point of view, only those animals dealt with which suffered from udder tuberculosis or were passing tubercle bacilli in their milk will be referred to.

In analysing the results of the clinical and biological examination of the dairy herds and their milk, it is proposed to consider each tuberculous sample as representing a source of infection in the milk, the origin of which may be one or more cows suffering from udder tuberculosis or passing tubercle bacilli in the milk. The object of so doing is to try to show more clearly the number of instances where a clinical examination of the cows concerned fails to detect a source of infection, because it will be generally admitted that a sample of milk taken directly into a sterile bottle from cows immediately after a clinical examination has been carried out and found on biological examination to contain tubercle bacilli, indicates, with very rare exceptions, that at least one cow suffering from udder tuberculosis has been missed by the clinician. The number of instances where a cow has been so missed at the clinical examination does not correspond to the number of cases of tuberculous udders eventually found in the investigation of positive mixed milk samples, because in the investigation of a positive sample, and particularly where the investigation is of a protracted nature, the cow or cows responsible for the source of infection in the sample may have been removed from the herd.

Under conditions where a post-clinical herd sample is taken for biological examination, it is possible to estimate with reference to udder tuberculosis (1) the number of cases found by the clinician, (2) the number of instances in which the condition is missed and (3) the number of cases found as a result of further biological and clinical examination. The difference between (3) and (2) represents the number of instances in which a cow or cows passing tubercle bacilli in the milk have been removed from the herd or herds before the investigation was completed.

The results obtained in Nottinghamshire under the schemes that have been carried out by the County Council for the detection of cows suffering from tuberculosis of the udder can be used as a basis for assessing the value of routine veterinary examination in the detection of such cases.

When the Veterinary Department was established in April, 1930, it was decided to inaugurate a system of herd milk sampling, which remained in operation until November, 1934. This scheme was directed chiefly at protecting the public from the dangers of tubercle infected milk, and consisted briefly in the collection of mixed samples of milk from each herd, except where the herds were small, in which case the milk of several herds was mixed together and constituted one sample. These herd samples were submitted for biological examination and all those reported positive were investigated in the usual way. This scheme had a wider application than that indicated, but as this application is not concerned directly with the main object of this article, it need not be stated.

Herd Milk Sampling Scheme

During the time the scheme was in operation, *i.e.*, from June, 1930, to October, 1934, 5,106 herd samples representing the milk from 71,000 cows, were submitted to biological examination, 450 being reported tuberculous. In the investigation of these positive samples, no source of infection was found in 75, indicating, with two exceptions where human infection was suspected, that a cow or cows suffering from tuberculosis of the udder or passing tubercle bacilli in the milk, had been removed from the herd between the collection of the tuberculous sample and the clinical examination of the herd. In the case of 375 samples, therefore, the source of infection still existed at the clinical examination. In 276 instances the source of infection was found at the first visit. In all cases, after cows that had been shown to be passing tubercle bacilli in their milk were excluded, group or control samples from the remainder of the herd, or herds, were submitted to biological examination. As these samples were drawn direct from the teats into sterile bottles, it would appear that any such sample reported tuberculous to the biological test represents an undetected source of infection in each such sample. That source is almost certain to be a tuberculous udder, but there may be more than one cow suffering from tuberculosis of the udder that contributed to any one positive mixed sample. Therefore it may be taken generally that each group or control sample reported tuberculous represents at least one cow suffering from tuberculosis of the udder that remained undetected by clinical examination. Of the control or group samples collected and submitted to biological examination, 99 were reported positive. Therefore out of a total of 375 tuberculous herd or mixed herd milk samples, the source of infection was found in 276 instances but remained undetected in 99.

In the investigation of the positive control or group samples (99), a definite source of infection was found in 80 instances, incriminating 89 tuberculous udders.

The figures under the headings numbered (1), (2) and (3) and previously mentioned, will therefore be respectively 276, 99 and 80. The difference between 99 and 80, namely 19, shows the number of cases where a cow or cows was removed before the investigation of the positive control or group samples was completed. These figures may not be absolutely accurate, as, for instance, where a producer buys in a cow suffering from udder tuberculosis during the investigation, but such an incident occurs so rarely that its effect on the figures would be negligible, and would not materially affect the result or the deductions drawn therefrom.

From these figures it will be seen that if the number of tuberculous udders missed at the first clinical examination is calculated on the number eventually found as a result of the biological examination of further group or control samples, the result definitely favours the clinician, and it would appear to be more accurate to consider the number of "misses" as represented by the number of control or group samples returned positive, when the proportion of missed to found is appreciably higher.

The above results were obtained from the examination of herds known to be giving tuberculous milk, a fact which gives the clinician a great advantage over a colleague who is examining herds where there is no special reason to suspect the presence of a cow suffering from tuberculous mastitis.

Routine Clinical Examination Supplemented by the Biological Examination of Post-clinical Mixed Herd Milk Samples

On the 1st November, 1934, the system of herd milk sampling was replaced by the routine clinical examination of the dairy herds supplemented by the biological examination of concomitant herd or mixed herd milk samples.

These samples were drawn direct into a sterile container from each cow giving any udder secretion after the exclusion of any cow suspected to be suffering from clinical tuberculosis, immediately after the clinical examination had been completed. By this means the risk of extraneous infection, either bovine or human, was reduced to a minimum.

The cows whose milk was excluded from the herd sample at the time of the clinical examination were those suspected to be suffering from tuberculous mastitis and those considered to be definite clinical cases. Samples of milk and/or sputum, or other material, were taken separately from such cows, and if the microscopic examination of the material was negative, a portion of the sample of milk was added to the herd or mixed herd sample. This procedure was adopted in order to ensure that the milk of every cow not found definitely tuberculous at the clinical examination would be included in the herd or mixed herd sample when submitted for the biological test.

The decision in Nottinghamshire to supplement the routine clinical examination of the dairy herds by the biological examination of the mixed milk of these herds was based on the information obtained during the operation of the herd milk sampling scheme with respect to the number of cows passing tubercle bacilli in the milk that were missed during the clinical examination. Under this scheme, the herds examined were those proved to be giving tuberculous milk, and it was assumed that in routine inspection, as usually practised where such information was not available, the number of cases of udder tuberculosis undetected by the clinician would be greater. Subsequent experience has proved this assumption to be correct and has shown the wisdom of checking the clinical examination by the submission of post-clinical mixed herd samples to the biological test. Moreover, the system of checking the clinical examination in this way engenders greater clinical efficiency and tends to the collection of more "individual" samples for microscopic examination, which results in the detection of a greater number of tuberculous udders during routine inspection.

In comparing the number of instances where cows suffering from udder tuberculosis remain undetected in the two systems, it must be remembered that in herd milk sampling the clinical examination was carried out in consequence of a positive report and therefore the "misses" are indicated by the number of positive control or group samples, whereas in the combined method the clinical examination is made in the course of an ordinary routine inspection of the herd, and the "misses" are estimated by the number of post-clinical herd or mixed herd samples reported positive.

In the case of the combined method, animals are examined in groups, and the results of routine clinical examination can be more properly compared with those of the biological examination by speaking in terms of such groups rather than in terms of individual animals, because in both cases the possibilities are that one or more than one case of udder tuberculosis may be present in the group.

The Comparable Groups

(1) The Biological Group, *i.e.*, the group of animals contributing to a sample submitted for biological examination.

(2) The Clinical Group, *i.e.*, the group of animals submitted to clinical examination which after the elimination of such animals as "fat," "dry" and animals affected with "open" tuberculosis, constitutes the biological group.

During the period from November 1st, 1934, to September 24th, 1937, 2,080 groups were

examined, comprising 121,995 cows for the clinical and 106,287 cows for the biological. The number of groups detected as tuberculous at the clinical examination was 167, and the number detected at the post-clinical biological examination was 196.

In terms of tuberculous udders found, the number in the 167 infected clinical groups was 174, and in the 196 infected biological groups the source of infection was found in 123 instances and comprised 142 cows.

The figures, therefore, under the headings (1), (2) and (3), previously referred to, are 167, 196 and 123. In 73 instances a cow or cows suffering from udder tuberculosis was removed before the investigation of the positive sample was completed.

As these figures indicate that working under favourable conditions a large number of cows passing tubercle bacilli in their milk are missed by routine veterinary inspection, it would appear necessary to employ every possible means available of increasing the efficiency of the system. The following criteria are regarded as essential:—

1. The Veterinary Officer performing the examination must be a really good clinician with a special knowledge of tuberculosis.

2. Adequate laboratory facilities must be provided for microscopic examination of milk, sputa, etc., which should be carried out by the clinician, or under his direction and supervision.

3. The number of animals examined should not be large. The actual number examined must depend to a great extent on local conditions, but it should be remembered that the important factor is the thoroughness with which each animal is examined and not the number "seen."

4. The examination should be carried out as soon as possible after milking.

5. The cows and shed must be reasonably clean.

6. The clinical examination should be supplemented by the taking of herd milk samples for biological examination.

7. Inspection should be carried out every three months.

8. All dry in-calf cows should be submitted for examination together with the other members of the herd.

9. The cows should be marked for the purpose of identification.

10. A herd register should be kept by every producer, which would give full information relating to any changes in the herd, including dry cows sent to grass and cows rejoining the herd.

In conclusion, I wish to express my gratitude to W. J. Ironside, M.R.C.V.S., M.P.S., for kindly reading a draft of this communication and for his valuable suggestions, many of which have been incorporated in the text.

A Brief Survey of the Results of Some Preliminary Tuberculin Tests in Dairy Herds

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Some headway has been made during recent months towards the establishment of tubercle-free herds in Durham County, by means of a voluntary scheme under which free preliminary tuberculin tests are available to the farmers. These preliminary tests are carried out by the county veterinary staff, and in some cases by the practitioners.

There is no obligation on the part of the farmer either to rid himself of reactors or to carry on with further tests, and it is found, perhaps due to the psychology of the average farmer, that when he is not tied down by obligations he is much keener to carry on providing his test has been at all satisfactory. Even in cases where there has been a large percentage of reactors amongst the adult stock the farmers are making efforts to isolate and preserve their clean young stock.

The factors which decide whether a farmer is eligible for a free test are:—

(*a*) He must be a registered cow-keeper under the Milk and Dairies Order of 1926.

(*b*) His premises must be of such a standard as would enable him to maintain a tubercle-free herd.

Other unofficial factors which are taken into account are the class of stock and the previous history of clinical tuberculosis.

It may be pointed out at this stage that in authorising the county staff to carry out free preliminary tests the Diseases of Animals Committee were actuated by a desire to stimulate the production of "tuberculin tested" milk in the county so as to satisfy the demands of the schools. This is why a number of "flying" herds and "mixed" herds have been tested, and it is interesting to note that twelve herds out of the total of 58 tested have since been licensed for the production of "tuberculin tested" milk. Others will come along in the near future.

The double intradermal test was used and synthetic tuberculin was obtained from the Royal Veterinary College, London. All bovine stock, including feeding bullocks which formed a small percentage, were tested and the bulk of the stock were Shorthorns with a sprinkling of Ayrshires, Friesians and crossbreds.

As a matter of interest the results of the herds which were tested by the county veterinary staff are appended, and for comparative

reasons the statistics have been classified into (*a*) "Flying" herds, (*b*) "Mixed" herds, and (*c*) "Breeding" herds.

"Flying" Herds

These were herds of bought-in adult stock with a small percentage of young stock bred from the bought-in cows. The results of the preliminary tests on 21 herds comprising 866 head of stock are what can be expected as the usual average in this type of herd, namely, 42 per cent. reactors.

The very young stock showed the smallest percentage and the reactors increased with the age of the animals. Even calves up to six months old reacted in 18·4 per cent. of cases, which emphasises the great difficulty one is faced with if any attempt is made to build up a tubercle-free herd from the average "flying" herd. Even the bullocks on these farms reacted in 25 per cent. of cases, and the fact that they are out in the fields most of their lives undoubtedly accounts for the percentage being as low as it is.

The highest percentage of reactors amongst the adult dairy stock on an individual farm was 75·0 and the lowest 26·7.

"Mixed" Herds

These herds consisted of about 75 per cent. home-bred adult stock, with young stock bred from the adult herd, and the average percentage of reactors in the 19 herds, comprising 973 head of stock, was 29·3.

The highest percentage of reactors amongst the adult stock in an individual herd was 54·3 and the lowest nil.

The percentage of reactors amongst the young calves under six months old was 5·8 for the 19 herds. This compares very favourably with the corresponding figure for the "flying" herds of 18·4 per cent. Here one finds a ray of hope, as there is a possibility of building up a tubercle-free herd from the young stock, provided buildings and fields are suitable for isolation purposes and the young calves are isolated immediately after birth. Without this precaution it will be seen from the figures that infection quickly spreads through the young stock.

A different position arises when the percentage of reactors in the adult stock is considered. This averages out at 42·5 per cent. compared with the 53·3 per cent. found in the "flying" herds, and as these figures are both very high it is obvious that little can be done with the adult stock, except perhaps in individual herds where the number of reactors is well below the average. In such cases young clean stock and the clean adults can be run as one herd whilst the reactors are isolated and sold off gradually. This method is, of course, not so easy to put into practice, but where the owner is very keen and conditions are suitable a clean herd can eventually be established.

"Breeding" Herds

These herds consisted of adult and young stock which had been home-bred, except in a few cases where a small number of individual animals had been bought from neighbours who are also breeders, but in no case had any animals come through a market. Practically all of the herds were situated in Teesdale, Weardale, and the western part of the county near the fells.

In 18 herds comprising 744 head of stock the average percentage of reactors was 3·6. The highest percentage of reactors amongst adult stock in an individual herd was 26·1 and the lowest nil. In one or two individual herds approximately 10 per cent. of the adult stock reacted to the test, and it seems reasonable to suppose that the unhygienic and almost insanitary condition of some of the alleged "dry" byres and outbuildings may be the explanation.

It will be observed that the young stock and the first-calf heifers were practically free from reactors. Actually, in the case of nine herds the whole of the stock passed the test. Some of these herds have now become "attested" and others are receiving "supervised assisted" tests.

It is very obvious that in these outlying home-bred herds some real progress can be made with the eradication question and, whilst the actual testing is comparatively simple, the pioneer work necessary in persuading farmers to become interested is sometimes very arduous and difficult. This has recently become a little more simplified owing to the fact that many of the town dairymen are now invading the outlying districts in search of "tuberculin tested" cows, and as the farmers are receiving much higher prices for their cows without the trouble of going to market, money is beginning to talk.

As already stated, the work in connection with these 58 herds has been done by the county veterinary staff. They have shown a very keen interest in the scheme, which has given an added zest to their routine inspection work. In all cases where the farmer has decided to continue in his efforts to establish a tubercle-free herd the subsequent tests have been done by the veterinary practitioner, who has been informed as to the condition of the herd after the preliminary test.

Whilst an apology must be made for the comparatively small number of herds dealt with in this brief survey, the figures do give some food for thought, as in the case of the consistent fall in the percentage of reactors classified as fourth calf cows. At the same time, one does not wish at this stage to express any strong opinions until the figures for a larger number of herds are available.

CLINICAL COMMUNICATIONS

An Unusual Sequel to Retention of the Afterbirth in a Dairy Cow

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TOWCESTER

SUBJECT.—Red shorthorn cow: second calf.

HISTORY.—I was called in on October 20th, 1937. She had calved the previous day, full time, a normal, live calf. The cow was not feeding and seemed distressed.

SYMPTOMS.—Temperature 105°. The breathing was quickened. Her ears were back and the expression anxious. Milk secretion was much reduced. Afterbirth retained.

TREATMENT.—I examined the afterbirth. It was dark crimson in colour, easily lacerated, and bled when handled. I could not remove it in that state. The uterus was douched and stimulants administered. The animal was warmly clothed, all food was removed and the calf placed in the adjoining pen. Linseed gruel and milk in addition was given every four hours by drenching.

October 21st.—Afterbirth taken away, with difficulty. The uterus was douched, and all septic fluid syphoned out. Spts. ammon. aromat. and nux vomica continued.

October 22nd and 23rd.—Douching and syphoning repeated. The patient improved well from day to day. Gruel, etc., were continued three times a day. The bowels were acting satisfactorily. The cow was so much better on the 23rd that she was left for a few days, the instructions being that one pint of a warm antiseptic solution was to be carefully injected into the vaginal passage night and morning.

COURSE OF RECOVERY.—I heard nothing further until October 30th, when a further request to see her came in. I now saw something very unusual. Midway between the stifle and hock on the right side there was a soft, round swelling, 6 inches in diameter. It was not tense or painful. I could not make up my mind what it was: I thought possibly it was the result of her lying on that side and bruising. When I examined the uterus, however, I found a thick discharge of pus over the *os*, and adhering to the walls of the vagina. Here, then, was the focus of infection, and I knew I was dealing with a generalised infection.

FURTHER TREATMENT.—I decided to open the thigh swelling and, on doing so, found it contained

STATISTICS SHOWING THE RESULTS OF 58 PRELIMINARY HERD TESTS CARRIED OUT IN DURHAM COUNTY.

	Calves.		Yearlings (prior to Service).	Heifers (prior to Calving).	Cows.					Bulls or Bullocks	Totals.
	1 to 6 Months.	6 to 9 Months.			1st Calf.	2nd Calf.	3rd Calf.	4th Calf.	Other Cows.		
"*Flying*" *Herds* (21)											
Reacted... ...	17	8	15	18	16	35	178	60	14	4	365
Passed	75	41	72	35	32	72	111	45	6	12	501
Totals ...	92	49	87	53	48	107	289	105	20	16	866
Percentage of Reactors...	18·4	16·3	17·2	33·9	33·3	32·7	61·5	57·1	70·0	25·0	42·1
"*Mixed*" *Herds* (19)											
Reacted... ...	8	8	26	23	30	47	68	39	28	8	285
Passed	129	66	94	74	57	42	89	74	25	38	688
Totals ...	137	74	120	97	87	89	157	113	53	46	973
Percentage of Reactors...	5·8	10·8	21·7	23·7	34·5	52·8	43·3	34·5	52·8	17·4	29·3
"*Breeding*" *Herds* (18)											
Reacted... ...	—	2	2	—	—	3	12	5	1	2	27
Passed	132	106	103	77	77	67	72	42	2	39	717
Totals ...	132	108	105	77	77	70	84	47	3	41	744
Percentage of Reactors...	—	1·8	1·9	—	—	4·3	14·3	10·6	33·3	4·8	3·6
Summary (58 herds)											
Reacted... ...	25	18	43	41	46	85	258	104	43	14	677
Passed	336	213	269	186	166	181	272	161	33	89	1906
Totals ...	361	231	312	227	212	266	530	265	76	103	2583
Percentage of Reactors...	6·9	7·7	13·7	18·0	21·6	31·9	48·6	39·2	56·5	13·5	26·2

thick pus. A thick slough, the size of a small banana, and of like shape, was taken from the interior. This abscess was syringed out twice daily, pressed on all sides, and plugged ; 50 c.c. prontosil was now given subcutaneously and the internal medicines continued. The passage (vaginal) was syringed twice daily with saline solution and dettol.

November 6th.—This abscess was responding satisfactorily, but to-day another one almost exactly like it was present on the left thigh in the corresponding position. Also a larger one existed on the right shoulder blade, stretching downward from the withers for 12 inches, and having a diameter of 8 inches. These two swellings were lanced and their contents of thick pus evacuated. From the thigh abscess I took two sloughs, very similar to those taken from the right side. From the shoulder abscess I took a slough, in shape and size like a small oyster. Both these swellings had the same characteristics : they were not painful, and not tense, and were like serous abscesses to the touch. The cow was (rather unexpectedly) feeding well, but she was very much reduced in condition. The temperature was 103·6°. I thought she had only a sporting chance of recovery but I kept on with the case because of its very real interest to me. No further hypodermic medication was practised.

November 8th.—Progress satisfactory. The cow licked herself and was feeding well. The medicine was now changed to the phosphates of iron and calcium. Gruel, etc., as before. The vaginal discharge was very much less in quantity, and becoming albuminous. Temperature 102·6°.

November 20th.—Thigh abscesses healed, Shoulder abscess still discharging a good deal. and not much altered in size. The treatment for this was altered to a saline solution with sulphocarbolate of zinc. Syringed twice daily as before.

December 10th.—Shoulder abscess almost gone: just a little swelling left near withers. Discharge almost ceased, but much clearer, with an occasional flake of pus. The cow had regained her normal condition and looked very lively and well. The cowman said she was giving two gallons of milk daily.

Remarks.—The uterus is a very common source of infection for *post-partum* ailments in dairy cows. Even if there is no discharge from the vagina it is never wise to rule out the possibility of this seat being the focus of any infection which presents unusual symptoms. I have seen many cases where the symptoms suggested Johne's disease or tuberculosis, but which revealed a septic or purulent state of the uterus on *post-mortem* examination. The high milk yields of dairy cows, and the very rich and concentrated food which they consume for that purpose to-day, render them much less resistant to bacterial invasion and collapse.

Cardiac Dilatation

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Many weeks ago an urgent call was received to attend a ten-year-old West Highland terrier in consequence of severe attacks of paroxysmal coughing. It was learnt that for some time there had been slight coughing, especially after climbing stairs or indulging in excessive exercise. Now, however, there was marked dyspnoea with severe bouts of coughing, terminating in retching.

The animal was very bad tempered and growled continually, factors which militated against efficient cardiac auscultation. Between the fidgeting and the growling, however, it was possible to hear that the first heart sound was loud and sharp, thus simulating the second sounds, but no systolic murmur was distinguishable. Râles and rhonchi were present in the chest.

The pulse was weak and rapid, and the cardiac impulse was feeble and diffuse. Cyanosis was not observed at the time of my visit.

The diagnosis was cardiac dilatation with pulmonary congestion, pericarditis with effusion being ruled out by the absence of pyrexia, absence of pain on palpation of the chest wall, and in view of the heart sounds being clear and sharp. Ascites or anasarca was not present.

The probability is that the dog had for long suffered from chronic bronchitis which, in its turn, led to dilatation of the heart or, at least, of the right ventricle.

A mixture was prescribed containing spt. ammon. arom., vin. ipecac., and syr. scillae, a dose of which was given three times daily, together with a 1 gr. digitalis pill.

In cardiac failure, especially when the pulse is feeble and rapid, digitalis is *par excellence* the remedy. It is especially indicated in failure of the right heart and in mitral regurgitation, but it is contra-indicated when there is full compensatory hypertrophy and the pulse is fairly strong, regular and slow, or if vomiting is occurring.

In acute cases of heart failure stimulants such as brandy, whisky, ether or caffeine, are indicated ; but strychnine is not useful as a cardiac stimulant.

The terrier in question had a warm jacket applied ; was ordered to be kept indoors, dry, warm, and strictly at rest. Meals were to be small and easily digested, and a mild dose of calomel was to be given weekly. Drinks of hot milk helped to relieve the cough, as also did medicated steam inhalations. Decided improvement followed the continued administration of digitalis, even after the first week. But the dog was senile, and as the weeks went by it became increasingly weaker until at last I had to put it to sleep.

The Veterinary Record

January 29th, 1938.

The Agriculture Act—Consultation Resumed

IN our previous issue we published a letter from the private secretary of the Minister of Agriculture, giving the reasons why the Minister refuses for the third time to meet representatives of the Association. Since then Sir Donald Fergusson—the Permanent Secretary to the Ministry—has asked some members of the Consultative Committee of the Association to come and see him and discuss frankly the present situation. As the result of this meeting it has been agreed that no reference to matters arising from meetings between the Ministry and the committee shall be made in this journal unless such statements are agreed by both participants in the consultation. This decision will facilitate the discussion of the Ministerial plans for utilising the services of practitioners, while these plans are still in the formative stage. The views of the Association will be considered at a time when modification of the proposed schemes is still possible.

It should be made clear that the arrangement will in no way restrict this journal in criticising favourably or otherwise the decisions finally reached by the Ministry. We shall continue to express our views clearly on scientific and other matters pertaining to the Government schemes, providing these matters do not arise from the confidential consultations between the Ministry and the Association.

Unfortunately I was not permitted to make an autopsy, to verify the diagnosis; but I thought these notes were justified if only to remind practitioners to pay close attention to the condition of the heart when called to treat merely a cough.

ABSTRACTS

[**The Lymphatic System of the Pig, with Special Reference to Meat Inspection.** Egehøj, J. (1937.) *Z. f. Fleisch und Milchhygiene.* **47.** 14-19, 273-278, 292-298, 313-315, 335-341, 353-360, 373-378.]

A knowledge of the lymphatic system from all aspects is essential for efficient veterinary inspection of meat. This series of articles deals exclusively with the pig and reviews the literature of much new work. The experiments were done by injecting 102 pigs of an average weight of 65 kg. in different ways. The choice of animal, injecting materials, sites of injection, and general technique are described in full.

General Distribution and Considerations.

The actual distribution of vessels varies but, as a general rule, the deep vessels run towards the heart in a centripetal manner, whereas the superficial vessels may run in all directions until they join up with the deep vessels. All vessels must drain through at least one gland before entering the blood stream. An afferent vessel is one which runs from the tissues to a gland, an efferent vessel (duct) is one which runs from a gland towards the blood stream. An afferent vessel from an organ runs under the serous coat to the gland. Vessels usually run with the blood vessels but may run independently or with the nerves. An efferent vessel is more likely to run with the blood stream and the afferent vessel with the nerve or independently. If two vessels are running parallel to one another, the lymph within them may be flowing in opposite directions. The possibility is entertained that in disease some lymph may flow in a retrograde fashion.

Regional Distribution

Head and Neck.

Situation of glands.

Submaxillary.—Behind the submaxillary salivary gland, around the submaxillary v.

Accessory Submaxillary.—At the junction of the submaxillary v. with the jugular v. on the sterno-thyroid m.

Parotid.—On the edge of the jaw, at the junction of the internal maxillary v. with the transverse facial v. covered by the parotid gland.

External Retropharyngeal.—Immediately behind the above, between the cleido-mastoid m. and the posterior auricular v. covered by the parotid gland.

Internal Retropharyngeal.—At the junction of the pharynx and the oesophagus, just behind the hyoid bone.

Dorsal Superficial Cervical or *Prescapular.*—In front of the shoulder joint on the serratus cervicalis under the omo-transversalis and trapezius mm.

Middle Superficial Cervical.—In front of the preceding, on the scalenus m.

Ventral Superficial Cervical.—Extend in a chain from the larynx to the region of the shoulder joint in the jugular furrow, between the jugular v. and the sterno-mastoid m.

Anterior Deep Cervical.—On the trachea behind the larynx.

Middle Deep Cervical.—On the middle third of the trachea in the neck.

Posterior Deep Cervical or *Prepectoral.*—On the trachea at the entrance to the chest; a large group.

The efferent ducts from the most important of these glands are shown in figure 1.

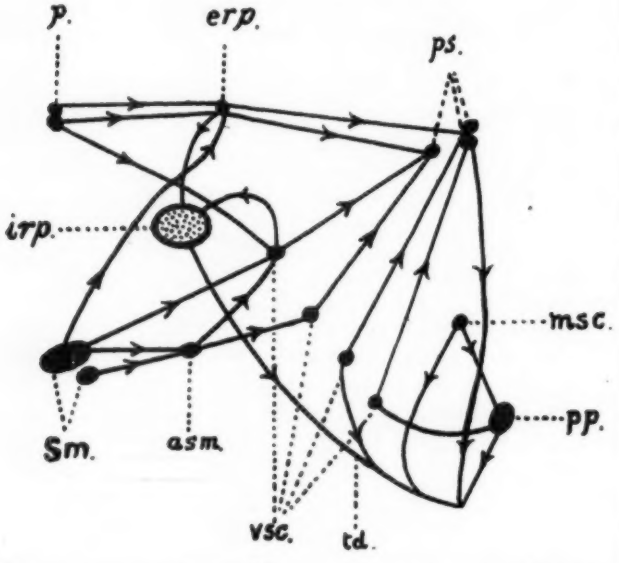

Fig. 1. s.m.—submaxillary g.; a.s.m.—accessory submaxillary g.; p.s.—prescapular g.; m.s.c.—middle superficial cervical g.; v.s.c.—ventral superficial cervical g.; e.r.p.—external retropharyngeal g.; i.r.p.—internal retropharyngeal g.; p.p.—prepectoral g.; t.d.—tracheal duct; p.—parotid g.

The tracheal duct runs from the internal retropharyngeal gland internal to the jugular v. to the entrance of the chest; here, on the left side, it drains into the thoracic duct; on the right side, into the jugular v.

The superficial and deep vessels to these glands, and to all other glands of the body, are described in detail. (The general arrangement of all vessels of the body has been referred to under general distribution.)

Reference for Meat Inspection.—As the tracheal duct runs from the internal retropharyngeal gland, infection in the chest may follow head infection more quickly than in those animals in which the duct runs from the external retropharyngeal. The prescapular drains a part of the head and neck region as well as the shoulder region. Examination of the neck need only be in the subcutaneous glands.

Fore Limb.

The cubital glands are absent. The axillary glands are usually absent; if present, they are represented by very small nodules near the prepectorals.

Afferent Vessels.—External superficial drain into one of the superficial glands. Internal superficial and all deep into the prepectorals.

Reference for Meat Inspection.—The presence of infection in the superficial cervicals and prepectorals calls for an examination of the fore limb as well as the head and neck. If infection is found in the fore limb, these glands must be carefully examined.

Thorax.

Situation of glands.

Bronchial.—Four groups. Right, between the trachea and right bronchus. Left, between the trachea and the left bronchus, covered by the aorta. Central, between the two bronchi at the bifurcation. Apical, around the root of the apical bronchus (right side).

Anterior Mediastinal.—In the anterior mediastinum between the two internal thoracic aa. under the oesophagus.

Posterior Mediastinal.—Around the posterior aorta in the posterior mediastinum, very near the thoracic duct. The efferent ducts from all these glands drain into the thoracic duct. The thoracic duct has the same course as in other animals. Occasionally a left duct is present, which runs in the chest underneath the left sympathetic nerve and joins the main duct after it has crossed the posterior aorta.

Afferent Vessels.—The afferent vessels of the lung are divided into superficial and deep, between which there is not a clear margin. The superficial as a rule pass over the surface of the lung and drain into the nearest gland. The superficial vessels of the diaphragmatic lobe pass along the pulmonary ligament through the hiatus oesophagus and drain into the coeliac glands. The deep vessels receive some branches from the superficial and pass along the course of the pulmonary aa. and vv. to the bronchial glands.

Reference for Meat Inspection.—Lesions of the bronchial glands suggest infection of the lung. The gland affected suggests in which part of the lung the disease process may be found. If the coeliac glands are affected the lesion may have spread from the posterior part of the lung.

BACK AND WITHERS.

Afferent Vessels.—Superficial drain into the prescapular, others run deep into the posterior mediastinal. Deep drain into both mediastinal.

Reference for Meat Inspection.—Not important, but abscesses of this region may produce secondary lesions in the draining glands.

CHEST WALL.

Afferent Vessels.—Superficial drain into the superficial cervical glands. Deep into prepectoral and both mediastinal.

Reference for Meat Inspection.—If superficial lesions of this area are found, examine the superficial cervical glands and prepectorals. Deep lesions, examine the mediastinals.

STERNUM.

Afferent Vessels.—Superficial run laterally and join those from the fore limb. Deep run through the pectoral mm. into prepectoral and both mediastinal glands.

ABDOMEN.

Situation of glands.

Coeliac.—Around the root of the coeliac axis a., particularly on the left side.

Gastric.—Along both sides of the lesser curvature of the stomach as far as hiatus oesophagus.

Splenic.—(1) In the hilus near the dorsal end of the spleen. (2) Around the whole course of the splenic artery.

Anterior Pancreatic.—Around the anterior part of the duodenal a. between the duodenum and the pancreas, near the portal fissure.

Posterior Pancreatic.—In the mesentery at the junction of duodenum and jejunum, just behind the pancreas.

Intestinal.—In the mesentery of the small intestine along the branches of the anterior mesenteric a.

Ileo-Caecal.—At the junction of the ileum, caecum and colon.

Colic.—Around the colic aa. in the spiral meso-colon.

Anterior Mesenteric.—Around the root of the anterior mesenteric a. closely related to the other groups in the neighbourhood.

Posterior Mesenteric.—Around the posterior mesenteric a. near the internal iliac and lumbar glands.

Hepatic.—In the portal fissure.

Renals.—In the hilus around the renal a.

Lumbar.—Left, between the aorta and psoas mm. Right, between the posterior vena cava and the psoas mm.

The efferent ducts from all these glands drain into the cisterna chyli. The manner in which they collect to form this cistern is shown in figures 2 and 3. The coeliac trunk is formed as shown in figure 2.

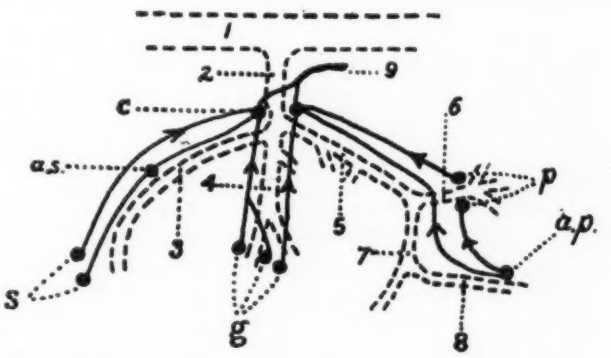

FIG. 2. 1.—posterior aorta; 2.—coeliac axis a.; 3.—splenic a.; 4.—gastric a.; 5.—hepatic a.; 6.—hepatic a. (propria); 7.—right gastro-omental a.; 8.—duodenal a.; 9.—coeliac trunk (lymphatic); s.—splenic g.; a.s.—accessory splenic g.; g.—gastric g.; c.—coeliac g.; p.—portal g.; a.p.—anterior pancreatic g.

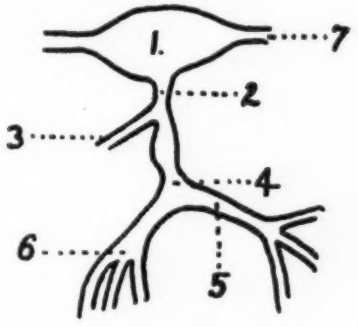

FIG. 3. 1.—cisterna chyli; 2.—intestinal trunk; 3.—coeliac trunk; 4.—mesenteric trunk; 5.—colic trunk; 6.—ileo-jejunal trunk; 7.—entrance of efferent ducts from hind limb and pelvis.

The ileo-jejunal trunk is formed by efferent ducts from the posterior pancreatic, intestinal and anterior mesenteric glands; the colic trunk by efferents from the ileo-colic, colic and part of the anterior mesenteric glands. (Efferent ducts from the posterior mesenteric gland probably pass direct to the cisterna chyli with the efferent ducts from the hind limb and pelvis.)

The afferent vessels to these glands pass from the various organs as follows. Stomach, into the splenic or gastric glands. Small intestine, into the posterior pancreatic or intestinal or anterior mesenteric glands. Caecum, into the ileo-caecal or colic glands. Colon, into the colic or ileo-caecal or anterior mesenteric glands. Liver, there is a similar arrangement of superficial and deep vessels as in the lung; they drain into the portal gland. Spleen, into the splenic or coeliac glands; some may pass direct to the cisterna chyli. Kidney, three sets of vessels; from the hilus and tissue of the gland, from the fibrous capsule, and from the fatty capsule, they all drain into the renals or lumbars. The afferent vessels from the abdominal wall pass with the blood vessels to the glands situated on the various arteries.

Reference for Meat Inspection.—As most of these glands are situated close together it is often hard to find the original focus of infection; a general examination is indicated.

UDDER.

Afferent Vessels.—Anterior superficial drain into the ventral superficial cervical. Posterior superficial drain into the supramammary. Anterior deep into the anterior mediastinal, posterior deep into the supramammary.

HIND LIMB.

Situation of glands.

Precrural.—In the fat of the flank midway between the angle of the haunch and the patella.

Superficial Inguinal.—(Supramammary in the female.) Male, on either side of the prepuce. Female, between the last teat and the abdominal muscles, below the brim of the pelvis; this group is larger in the sow than in the gilt.

Popliteal.—In over 50 per cent. of pigs superficial and deep glands are present, in the remainder superficial only are present.

Superficial Popliteal.—Hartenstein's gland, tarsal gland of Sisson. "Hand's breath" above the hock in the fascia in front of the tendo achilles.

Deep Popliteal.—Behind the stifle joint between the biceps femoris and semitendinosus mm. on the bellies of the gastrocnemius m.

External Iliac.—On the sub-lumbar mm. between the root of the circumflex iliac and external iliac aa.

Internal Iliac.—On the sub-lumbar mm. between the external and internal iliac aa.

Deep Inguinal.—Around the external iliac aa. at the origin of the deep femoral a.

External Sacral or Ischiatic.—On the sacrosciatic ligament above the superior ischiatic spine, covered by the middle gluteus and biceps femoris mm. one or two glands lie on the extra pelvic part of the obturator internus m.

Gluteal.—Present in 10 per cent. of cases on the ischium under the biceps femoris m.

The efferent ducts from these glands are shown in figure (4).

If the deep popliteal is absent, the efferent vessels pass from the superficial popliteal as from the deep. If the gluteal is absent the vessels pass direct to the ischiatic. From the external and internal iliacs, the lumbars and the deep inguinal efferent pass direct to the cisterna chyli.

Afferent Vessels.—Superficial and deep below the tarsus to the popliteal glands. Superficial above the tarsus to the superficial inguinal or precrural. Deep above the tarsus to the lumbars or internal iliac or deep inguinal glands.

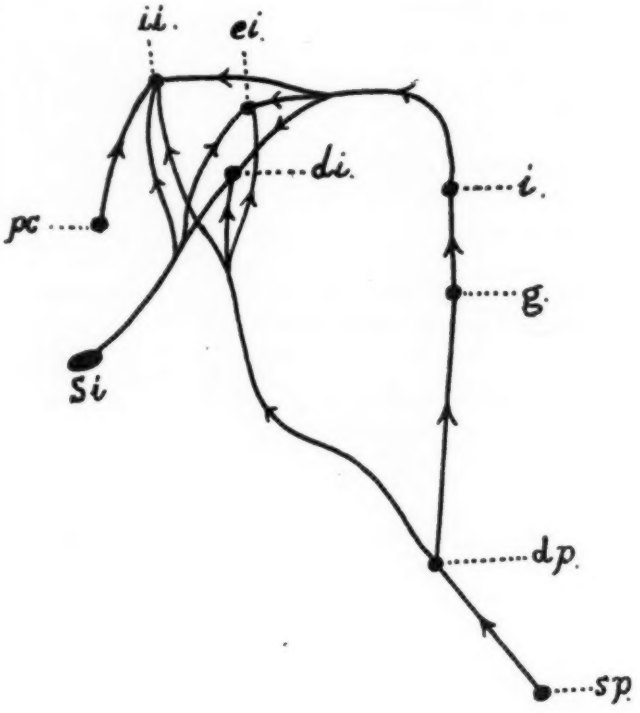

FIG. 4. s.i.—superficial inguinal g.; p.c.—precrural g.; d.p.—deep popliteal g.; s.p.—superficial popliteal g.; g.—gluteal g.; i.—ischiatic g.; i.i.—internal iliac g.; e.i.—external iliac g.; d.i.—deep inguinal g.

Reference for Meat Inspection.—Any lesion originating from the hind limb will show in either the internal iliac, external iliac, or deep inguinal glands.

C. W. O.

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Tuberculosis—an Occasional Cause of Abortion in Cattle. CANHAM, A. S. (1937.) *J. S. Afric. V.M.A.* **8.** 3. (Sept., 1937.)

Two cases selected from a number of abortions which have occurred in a herd free from brucella and trichomonas infection are recorded. In the first, allantoic fluid from a three-months foetus aborted complete in its membranes infected guinea-pigs with tuberculosis. The cow was unfortunately not tuberculin tested, but she showed no clinical signs of tuberculosis. In the second case a six-months aborted foetus showed tuberculous lesions in liver and spleen, and in portal, mediastinal and bronchial lymphatic glands, and there was ascites. Acid-fast bacteria were demonstrated in smears from the glands and in stomach contents. Guinea-pig inoculation with material from these sites was positive. The cow showed a marked reaction to the intradermal tuberculin test, was slaughtered and *post-mortem* revealed generalised tuberculosis. The uterine wall was greatly

thickened with numerous nodules at all depths. The ovary was also affected, but the udder and supramammary lymphatic glands were normal. The gradual extension of tuberculosis in the uterus is suggested as the cause of foetal death and abortion.

F. W.

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[**The X-ray Diagnosis of Navicular Disease.** Dunemann, H. *Tierärztl. Rdsch.* **43.** 11 and 12. 177-182 and 195-197.]

The paper opens with a systematic description of navicular disease and the author shows how it is impossible definitely by clinical examination alone to diagnose it. He then considers roentgenology and states that it is essential for clinicians employing it to be intimately acquainted with their apparatus and its use on horses before they can presume to form opinions on the photographs they make.

Dünemann investigated the possibilities of taking X-ray photographs of the foot in two directions—the latero-medial and the dorso-volar. The former method is desirable in theory because it enables the navicular bone to be viewed by itself without the superimposition of shadows of the other bones upon it. To obtain a result of appreciable value it is, however, necessary to project the rays through it from end to end exactly in its mid-line: this was found to be impossible except by the laborious and expensive procedure of making one exposure and following it by a series of seven or more others after serially moving the position of the X-ray tube so many degrees in various planes. Another hindrance is provided by the necessity to use hard rays with a short exposure instead of soft rays and a long exposure. Hard rays scatter much more and give a less clear picture. The usual exposure time used in the author's clinic is one-tenth to one-thirtieth of a second.

Oxspring's findings of exostoses at the ends and along the posterior border of the navicular bone are discussed, and it is admitted that the latero-medial method is useless for showing them; cavities in the bone are also very difficult to show by this method.

With regard to the dorso-volar method, Oxspring's work and opinions are carefully discussed, but Dünemann holds that the latter's claim to diagnose incipient navicular disease (before the appearance of clinical symptoms) is much too optimistic. Dünemann states that the natural form of the navicular bone is so variable that it is unsafe to put any significance on slight projections, etc., seen in the pictures. Areas of decalcification must be of relatively long standing and be associated with well-established navicular disease. Moreover, it is one thing to see cavities in the bone, but quite another thing to assert that they are a sign of navicular disease, which is causing lameness. In short, the dorso-volar method is a very useful contributory aid, but it cannot show what other methods of examination are unable to reveal.

There is another method, which goes some way to assist diagnosis; it is the injection of a local anæsthetic into the pedal joint, this being one of many joints for which Forssell worked out the procedure of diagnosing lameness due to arthritis. The joint capsule has a prolongation beyond the anterior articular bone margins upwards on the face of the second phalanx, and it can be entered by means of a hypodermic needle inserted through the extensor tendon. The entire joint can thus be anæsthetised and any lameness arising from disease therein diagnosed. Dünemann states that a combination of Oxspring's and Forssell's methods enables one to make a certain diagnosis of navicular disease.

[It seems to be doubtful whether such an injection would anæsthetise the navicular bone as a whole, and it would presumably have no effect on the navicular bursa; therefore, if a horse is lame from navicular disease centred in that part of the bone covered by the bursa and against an inflamed flexor tendon, the lameness would not be influenced by the injection.—*Abstractor.*]

J. E.

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[**Air-Borne Infection.** Wells, W. F., and Wells, Mildred W. (1936.) *J. Amer. Vet. Med. Assoc.* **107.** 1698-1703 and 1805-1809. 5 figures and 2 tables.]

As bacteria have no power to invade the atmosphere except in association with other matter, their flight range is determined not by their size but by the character of the matter with which they are associated. Transmission of infection through the air may take one of two forms, depending on the size of the infected droplet. Droplet infection proper applies to droplets larger than 0·1 mm. diameter which are rapidly removed from the air by gravity before they can dry and within a short distance from the source. The second form, termed air-borne infection, deals with the dried residues of infected droplets which were less than 0·1 mm. in diameter. These are dependent on the air for the buoyancy that keeps them suspended for longer periods and carries them longer distances than droplets. Epidemiologically there are in consequence essential differences between these two forms of infection. Droplet infection is localised and concentrated, while air-borne infection is more dispersed and dilute.

Of importance in the spread of air-borne infection is the viability of bacteria associated with droplet nuclei. Organisms characteristic of the respiratory tract were found to be

decidedly more viable in air than those whose characteristic habitat is the intestinal tract. A deduction arrived at as a result of sampling air in different occupied atmospheres is that the numbers of alpha streptococci present correspond to the degree of contamination by the occupants. It is considered, therefore, that the atmospheric content of the alpha streptococcus should be regarded as an index of naso-pharyngeal contamination of the air just as *Bact. coli* in drinking water indicates the degree of intestinal contamination.

The universality of naso-pharyngeal infection does not prove that it is air-borne, but it meets the objection that, if air were infective, naso-pharyngeal disease would be universal. There is good reason to believe that only that phase of contact which is called air-borne infection can be swift enough to explain the epidemic spread of naso-pharyngeal disease in non-immune populations.

In studying the effect of certain factors on the dispersion and viability of micro-organisms suspended in the air, it was found that by increasing the relative humidity there was a reduction in the number of bacteria in the atmosphere. Ozone in tolerable concentrations, and commercial germicidal sprays were found to give similar results, but the bactericidal effect of ultra-violet radiation proved to be of a higher order of magnitude than all these. Humidity greatly affects the bactericidal effect of ultra-violet rays, their killing power at low humidities being approximately ten times that obtained at higher humidities. The maximum lethal action is obtained with wavelengths of light lying in a zone midway between 200 and 300 millimicrons. Cell units of the organisms so far tested (streptococci, staphylococci, sarcinae and *Bact. coli*) have proved to be equally vulnerable to ultra-violet radiation. J. W. W.

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[I.—Short Wave Therapy in Veterinary Medicine. Huntersatz (1936.) *Z. Veterinärk.* 48. 1, 1-25; **II.—Short Wave Therapy.** Zschocke, F. *Ibid.* 8. 328-331.]

I.—In high frequency treatment it is possible to use two wavebands, long waves with a wavelength of 600 metres down to 100 metres, and short waves of 30 to 1 metre. The former are much less penetrative and have to be applied by electrodes placed in close contact with the skin and kept moist, this method constituting diathermy. Short waves or ultra-short waves are highly penetrative and are given off from suitable poles through the atmosphere like wireless waves and act on bodies which happen to be situated in their field—that is, without contact between the poles and the body.

As far as is known at present both types of wave act on the bodies of animals by causing heat therein and have no additional specific action on them.

I.—Hintersatz used a Siemens-Reininger "Ultratherm" apparatus giving waves of 6 metre length at 300 watts, which were applied to the bodies of horses by means of a pair of condensor electrodes made of pliable material covered with rubber. Electrodes of various shapes and sizes were used.

Treatment was applied to a total of 119 horses affected with numerous disease conditions (wounds, strangles, respiratory disease, spasmodic colic, harness galls, abscesses, periostitis, sprains, arthritis, etc.) and usually a course of treatments from one to 13 in number, each lasting from 15 to 30 minutes, was given. No other form of treatment was given during the same period. Some horses were treated every day and some every second day. From the perusal of the tabulated findings, the results were excellent, the great majority of cases being designated "cured."

Although at first sceptical, the author soon became enthusiastic, as rapid cures were obtained and the apparatus was very nice to use and the horses appeared to enjoy being treated.

II.—Using similar apparatus, Zschocke treated a number of cases of chronic suppuration in horses and obtained different results. A bad case of fistula running down behind the scapula was cured after 35 irradiations, but some cases of fistulous withers and poll-evil did not respond, nor did some of elephantiasis (presumably chronic cellulitis and lymphangitis).

Summing up the results of both reporters, the latter finds that ultra-short wave therapy is more successful in acute, than in chronic, inflammation; that it is hyperaemic and anodyne in action and that it is valuable in inducing warmth in deep parts. J. E.

ROYAL SANITARY INSTITUTE CONGRESS

The Right Hon. the Earl of Bessborough has consented to act as President of the Health Congress of the Royal Sanitary Institute which is to be held at Portsmouth from July 11th to 16th, 1938.

The Congress will be divided into sections dealing with preventive medicine; architecture, town planning and engineering; maternity, child welfare and school hygiene; veterinary hygiene; national health insurance; hygiene of food, and tropical hygiene. In addition, there will be conferences of representatives of local authorities, medical officers of health, engineers and surveyors, sanitary inspectors and health visitors.

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It is revealed in a report issued by Scotland Yard on the latest census taken of London traffic that in the past ten years the volume of horse-drawn traffic has decreased by nearly 66 per cent. The census was taken by Metropolitan and City of London police officers.

REVIEWS

[**Taglioni's Grandson.** By Peter Shiraeff. Translated by Alfred Fremantle. Published by Putnam and Co., Ltd., 42, Great Russell Street, W.C.1. Price 7s. 6d.]

Peter Shiraeff died at the early age of 49 in the year 1935. While at school the author became involved in revolutionary activities and he was exiled to Siberia. He returned to Russia in 1917 and took an active part with the Red Army in the civil war. His literary output was small and consisted only of three or four volumes: in Russia "Taglioni's Grandson" is counted as his masterpiece.

The story is one of horses and horsemen, and it begins in the year 1915 when Russia was at war. Russia was a great centre for the sport of "trotting" and racing, and an account is given of some of the most famous men and animals of this era. Particular emphasis is laid upon the virtues of the Orloff strain of Russian trotters which was developed by that great breeder, Count Orloff Chesmensky in the early years of last century.

In the early part of the book the central figure is one Olimp Loutoshkin, the illegitimate son of a noble father who is a trainer for the Moscow track. He thinks that he has found in the mare Flattery by Firedrake out of Pepperbrandy the greatest trotter of all time. Revolution intervenes, the trotters are dispersed and the famous breeding and training stud of Aristarkh Bourmin burnt to the ground. Flattery undergoes many hardships and she ultimately comes into the possession of a peasant called Nikita. Nikita is forced to exchange his fine stallion for the apparently broken-down mare. In desperation he approaches his friend Alexander Egovitch, the veterinarian. Egovitch, a man of great character, recognises the mare and by the aid of his treatment and counsel Flattery is restored to full health.

The original hopes of Loutoshkin are realised not by Flattery but by her son, who, of course, is Taglioni's grandson.

The author's character studies of men are good: Alexander Egovitch, the kindly veterinary surgeon, is given great prominence. The book will appeal to all, but it has especial claims upon those who are lovers of horses.

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[**"Fertility and Animal Breeding."** Bulletin No. 39, Ministry of Agriculture and Fisheries, H.M. Stationery Office. Price 1s. 3d.]

The present issue is the fourth edition of this bulletin, the first being issued in 1925. It is based on the results of research work, and

(*Concluded at foot of next column.*)

has been brought well up-to-date. It is written in extremely simple language and is intended for the lay reader. The bias of the authors has been practical throughout. Such consideration of the anatomy and physiology of the reproductive organs as has been included, is intended to give the lay reader an intelligent understanding of the more practical discussion on applied breeding which forms the major portion of the book.

There is a very large amount of information compressed into the comparatively short space of some 50 pages and, though there are some statements which the veterinarian may find it difficult to reconcile with his experience in general practice, by far the greater part of the bulletin is accurate and useful. We can recommend it to our readers as good value for its low price.

REPORT

University of London Animal Welfare Society: Eleventh Annual Report

The Eleventh Annual Report of the University of London Animal Welfare Society is to hand. The President is Sir Frederick Hobday who, in a foreword, draws attention to the increasing interest being taken in animal welfare by scientific men and women. The Society has branches in ten colleges of the University, that at the Royal Veterinary College being particularly strong. Many countries are representde by corresponding members of council.

During the year under report, public meetings have been held in various towns. At the ordinary branch meetings, and in a series of lectures to adult audiences, lectures on various aspects of animal life and welfare were given by members of a panel of speakers: by means of this panel the Society has at hand many lecturers who are authorities on their own particular subject.

The most important development during the year was the Society's campaign against the gin trap.

The booklet makes interesting reading; it shows that the Society is a progressive one and one which wishes to extend its activities and views by education and reason rather than by force. The Society has an imposing list of officers drawn from all walks of scientific life and who, contrary to the usual custom, appear to take an active personal interest in its work.

It is pleasing to note that the financial position is sound.

The office of the Society is at 42, Torrington Square, W.C.1, and the period under review is rom August 1st, 1936, to September 30th, 1937.

N.V.M.A. DIVISIONAL REPORT

North of England V.M.A.*

MEETING AT NEWCASTLE-ON-TYNE

A General Meeting of the above association was held in the Agricultural Department, King's College, Newcastle-on-Tyne, on Saturday, December 11th, 1937, at 3 p.m., when there were present Messrs. J. J. McDowall (President), F. J. L. Croudace, H. S. Elphick, F. Christopher, T. R. Jarvie, J. R. Rider, T. M. Mitchell, J. D. Peele, E. R. Callender, J. O. Powley, G. Atkinson, G. M. G. Oliver, A. L. Bartholomew, J. P. Pickering, and the Hon. Secretary, Mr. W. Lyle Stewart.

Apologies for absence were received from Messrs. W. A. Doughty, W. Jackson Young and J. H. Taylor.

The minutes of the previous meeting, having been published in the *Veterinary Record*, were taken as read and signed by the President.

Election as Honorary Member.—The SECRETARY stated that two Council Meetings had been held since the last General Meeting, one at Durham and the other at Newcastle. The Council recommended to the General Meeting that Mr. J. H. Taylor, of Darlington, be elected an Honorary Member of the Association to mark the honour conferred by his acceptance of the Mayoralty of Darlington for the coming year. This was carried unanimously by the meeting and the Secretary was empowered to take the necessary action.

The late Dr. O. Charnock Bradley.—The PRESIDENT and Mr. J. R. RIDER paid tribute to the late Dr. O. Charnock Bradley. The late Principal was an Honorary Member of the North of England Veterinary Medical Association and it was generally felt that each member had lost a personal friend. Mr. J. R. RIDER moved that a letter of condolence be sent either to the Secretary of the College or to the late Dr. Bradley's brother.

Correspondence.—(1) The Council considered a letter from the Clerk of the Durham County Council asking for a copy of the Association's scale of fees for tuberculin testing. The Council decided that it should be left to the President, Mr. J. R. Rider and the Hon. Secretary to draft a suitable reply. The meeting reaffirmed this decision, and members expressed the view that the information asked for should not be given.

(2) The Hon. Secretary also read a letter from a London student desirous of coming north to gain some experience of veterinary practice.

*Received for publication December 24th, 1937.

Fees for Tuberculin Testing.—Mr. J. D. PEELE moved "that the scale of fees laid down for the remuneration of veterinary practitioners by the Ministry of Agriculture be accepted as the minimum scale of fees by the Division for the testing of commercial herds." This was seconded by Mr. BARTHOLOMEW. After discussion and a vote, it was decided that the scale of fees operating under the voluntary scheme for building up tubercle-free herds in the County of Durham be adopted as a uniform scale for veterinary practitioners in the Association. Mr. ELPHICK proposed that the Secretary send a copy of this scale to each member of the Association. This was agreed to.

Veterinary Film.—Mr. Cochrane and Mr. Clifton, of Messrs. T. J. Smith and Nephew, Ltd., Hull, introduced their film, "The Treatment of Fractures in the Dog and Cat." Mr. Cochrane stated that he was most pleased to be present and, although a layman, would endeavour to answer questions relating to the technical matters involved. The film was produced in the Beaumont Institute of the Royal Veterinary College, under the guidance of Professor Wright.

The film display proved of much interest to members, and led to a good discussion in which the following took part: Messrs. Mitchell, Elphick, McDowall, Pickering, Oliver and Dr. Ponsford. The PRESIDENT proposed that the meeting accord a vote of thanks to Messrs. Smith and Nephew, Ltd., for the trouble they had undertaken in presenting films of such topical interest to members of the veterinary profession. This was carried with acclamation. On behalf of Messrs. Smith and Nephew, Ltd., both Mr. Cochrane and Mr. Clifton made suitable replies.

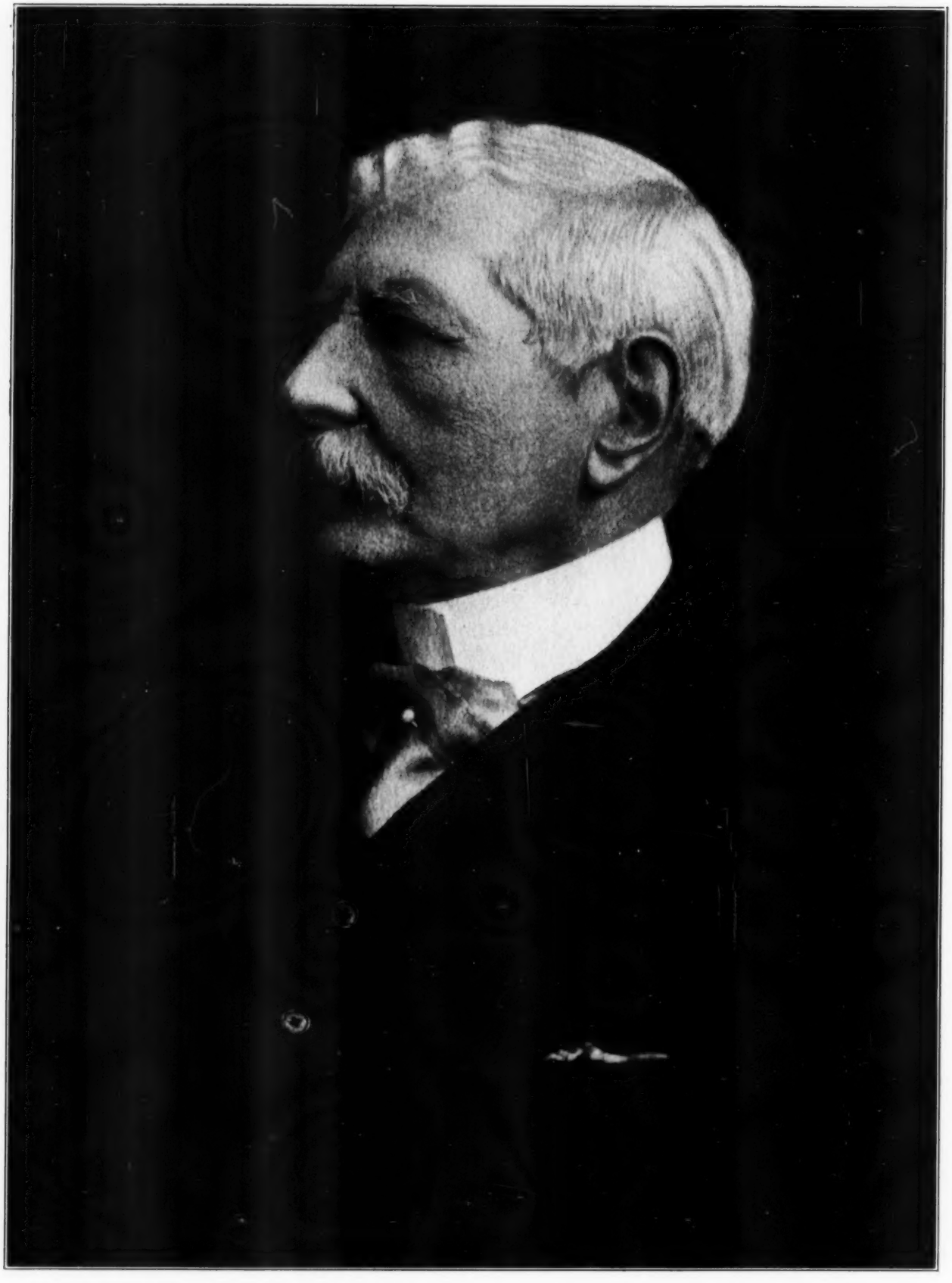
Benevolence.—The PRESIDENT reported that the proceeds of the Dinner-Dance, which was held in Sunderland on December 3rd, amounted to ten guineas. The Treasurer was authorised to send a cheque for £7 10s. 0d. to the Treasurer of the Victoria Veterinary Benevolent Fund, and to pay the remaining £3 to Mrs. J. W. Rider to assist in providing Christmas comforts to certain recipients of the Fund residing in the north.

Treatment of Sick Animals of Poor Persons.—Under "Any Other Business," the SECRETARY referred to a letter received from the N.V.M.A. relating to R.S.P.C.A. clinics, and stated that after very full consideration the Council recommended to the General Meeting that they accept the recommendations made by the Organising Committee with the following alterations:—

Page 1, *paragraph* 4 (*i*).—The Council were of the opinion that the duties of almoner might in most cases be taken over by the veterinary surgeons attending the clinics.

4 (*iii*).—The Council recommended that this clause be deleted and replaced as follows:—

(*Continued at foot of col.* 1, *page* 131.)



THE LATE CAPTAIN ADRIAN JONES, M.V.O., M.R.C.V.S., HON. ASSOCIATE R.C.V.S., F.R.B,S.

R.C.V.S. Obituary

CAPTAIN ADRIAN JONES,

M.V.O., M.R.C.V.S., HON ASSOCIATE R.C.V.S., F.R.B.S.

Famous Sculptor of Horses

We record with the deepest regret the death, which took place on Monday last after an illness from influenza and bronchitis of several weeks' duration, of Captain Alfred Adrian Jones, M.V.O., late A.V.D., Hon. Associate R.C.V.S., F.R.B.S., the eminent sculptor member of the veterinary profession, who passed away at his home, Church Street, Chelsea, at the great age of 92 years.

As befitted one qualified to practise the veterinary art—he graduated from the London College on April 25th, 1865—Captain Adrian Jones, with an unrivalled knowledge of the anatomy and conformation of his favourite subject, the horse, held a unique position as an accurate, forcefully convincing sculptor of the equine form, and many of his equestrian groups are recognised masterpieces and occupy commanding sites in the metropolis and elsewhere.

Of the numerous veterinarians whose achievements in other spheres of activity have reflected distinction upon this profession, there has been none whose association has been a source of greater pride to his fellow members, in the knowledge that his training at the Royal Veterinary College made a vital contribution to his great career as a sculptor. While the eye of the veterinary man was held by the accuracy of his work in respect of anatomical detail, "stance" and poise, the universal admiration of connoisseurs was commanded also by the artistic skill with which he applied that special knowledge to structure as affecting form in movement and by his extraordinary mastery of the mechanical and technical side of his art. The beauty and vigour of Adrian Jones' equine studies and the perfection of grouping of his larger compositions, have secured for his pieces a foremost place, not only among British sculptural works, but those of the whole world.

On two occasions in recent years the pages of this journal have borne photographic witness to the genius of the "profession's own sculptor," as we were proud to claim him. In our issue of December 30th, 1933, in the notice of his fascinating "Memoirs of a Soldier Artist," it was our privilege not only to review his adventurous career, but to record and illustrate his artistic triumphs, and a reference to those pages (*Veterinary Record*, **13**. 52. 1418-1419) and plates will well reward the reader seeking further tribute. The year 1935 marked the setting of the supreme seal upon his fame, all too belatedly (on his ninetieth birthday), by the award of the gold medal of the Royal Society of British Sculptors—the greatest distinction in British sculpture. He then took occasion, in an article in *The Times*, "A Testament of Beauty," to express his own ideals in sculpture, in which, speaking of the principles he used in the execution of his work, he said:—

> The principles first of all say that nothing human or animal of God's creation should be in any way distorted or made a laughing stock of. Therefore, the thing was to do an effigy in a simple pose which would carry with it the appearance of the object, or some other characteristics. I don't want people to think (he added) that I suggest a facsimile of any object that they are producing will represent the object they are seeking. All live things look bigger than dead ones. Secondly, a facsimile work of the model will never fill the eye or the sense of proportion. It has to be increased in different places without disturbing the anatomy to produce the effect of reality.

The second of the occasions to which we refer above was the illustrated announcement made in our issue of June 19th of last year, of the establishment of an appeal fund to enable the profession to acquire for Adrian Jones' *alma mater*, that glorious group, "Duncan's Horses," which was shown in the Academy of 1892, and which, having escaped almost unscathed from the disastrous fire at the Crystal Palace, was

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(1) The R.S.P.C.A. should be asked to provide all drugs, dressings, instruments, etc., and that these should be kept in a locked cupboard, the keys of which should be in the possession only of the attending surgeons.

(2) Any payments made or offered by people attending the clinic shall be placed in the box provided and that this money should be used to pay for the cost of drugs, dressings, etc.

(3) Persons who attend the clinic and are in a position to pay an ordinary professional fee should make this payment to the surgeon in attendance, who will contribute to the R.S.P.C.A. Branch a sum representing the cost of the drugs and dressings used.

4 (*vi*) That this clause be altered to read as follows: "The local branch of the R.S.P.C.A. should advertise the Central Clinic regularly in the local Press and by poster, stressing the fact that treatment is carried out by veterinary surgeons."

After some discussion, Mr. Elphick proposed that the Council's recommendations be forwarded to the Organising Committee of the "National." Mr. Mitchell seconded, and this was unanimously agreed by the meeting.

W. Lyle Stewart, *Hon. Secretary.*

generously offered by the sculptor to the London School subject to the defraying of certain costs. Adrian Jones himself had the project much at heart, and we can only lament the poignant nature of the stimulus now given to the fund by its acquirement of a memorial significance. In this connection, Major G. W. Dunkin, the primary sponsor of the appeal, writes: "It may interest your readers to know that we have succeeded in securing sufficient to cover the immediate repairs which have now been completed, but we require immediately a further £900 in order to get the statue cast in bronze. It was my one wish to have the whole thing completed and erected on a suitable plinth at the college in suitable surroundings with Captain Jones present, but that is not to be. We mourn the loss of one who was not only a renowned sculptor but a gallant soldier, and withal a veterinary surgeon. Great men in our profession are all too few and we can ill afford to lose any of them."

"Duncan's Horses" was Captain Adrian Jones' first success, and was in fact executed in a spirit of challenge to the opposition to his efforts of certain official fellow-artists. The title was suggested by Shakespeare's line in "Macbeth":

'Tis said they eat each other.

This work had a triumphant reception and henceforth Jones was to receive as many demands for important public monuments as he was able to cope with. The admiration shown for his work by King Edward VII, then Prince of Wales, was in this respect a very valuable asset.

In 1903 he completed the memorial to the Royal Marines in St. James's Park; in 1906 that to the Carabineers on the Chelsea Embankment; and in 1907 he began the Whitehall statue of the Duke of Cambridge.

His outstanding memorial, and the crown of his success as an artist and sculptor, unquestionably is the Quadriga, representing Peace, which finds a fitting place on the Decimus Burton Arch on Constitution Hill. No larger piece of sculpture has even been produced in this country: the casting weighs 38 tons, and the figure of Peace is 14 feet high. King Edward VII was keenly interested in the progress of the work, and his Derby winner, Persimmon, was used as a model for one of the chariot horses; indeed, it was at the King's suggestion that the Arch was chosen as its site The design—Peace Descending upon the Chariot of War—was, said the sculptor himself, intended as his tribute to Edward the Peacemaker. Of his later memorials, perhaps the most pleasing is that of the Cavalry at Stanhope Gate in Hyde Park, depicting St. George, the patron saint of Cavalry, having slain the dragon. In this the knight "Dignity" is represented by the armoured man on his charger, the spiritual motive being derived from "The Saint," who causes him to uplift his sword and proclaim that the enemy is killed and it is safe for the people to come by; others are the Soldiers' National Memorial, Adelaide; the statue of "Persimmon" at Sandringham; and that of General Sir Redvers Buller, V.C., at Exeter.

THE QUADRIGA OF PEACE
(Constitution Hill)

It is difficult to assess the value and the merit of the labours of his hands, but among his numerous memorials, paintings and statuettes, allusion may be made to a few of outstanding merit, in addition to those already mentioned: "Gone Away"—a statuette representing a mounted huntsman and two hounds which won the Goldsmiths' Company's first prize in 1885;

"The Last Arrow"—a model of a North American Indian on horseback, shown in the Old Grosvenor Gallery in 1888; "The Royal Standard Bearer"—a statuette presented to the Duke and Duchess of York by the officers, 2nd Life Guards, on the occasion of their marriage in 1893; "Maternal Care"—a life-size group, exhibited at the Royal Academy in 1893; "Forager"—a prize foxhound of the Pytchley Kennels owned by Earl Spencer, 1893; "The Rape of the Sabines"—a life-size group, exhibited at the Royal Academy, 1894; "Waterloo"—Picton's Brigade about to advance; "For the Faith"—a model of a crusader, exhibited Royal Academy, 1903, and "Action Front," exhibited Royal Academy, 1921.

A gifted painter as well as a sculptor, Captain Jones executed a notable portrait of Earl Haig, and had done in oils several of King Edward VII's racehorses, including the famous Derby winners, "Persimmon" and "Diamond Jubilee." His portrait of Lord Kitchener is at Ipswich, and he also painted an equestrian portrait of Sir David Campbell, Governor of Malta, on his Grand National winner, "The Soarer," and several works in pure landscape.

Captain Adrian Jones was born at Ludlow, Shropshire, on February 9th, 1845, being the fourth son of James Brookholding Jones, and educated at Ludlow Grammar School. While a schoolboy he was a keen follower of the Ludlow Foxhounds. This activity played a part in his decision to become a veterinary surgeon.

It was in that capacity that he joined the army, in which he saw 23 years' service, and was attached in turn to the 3rd Hussars, the Queen's Bays and the 2nd Life Guards. He saw active service in Abyssinia, 1868 (medal), Boer War, 1881, and Nile Expedition (medal and clasp and Khedive's Star). His most exciting military experience was his participation in the Abyssinian War of 1868, of which he claimed to be the last British survivor. He was present at the taking of Magdala.

He had always had artistic tastes and in the course of his Army life he found time to gratify them, his inclinations leading him to painting. He made many studies of chargers and racehorses belonging to his brother officers.

It was not until his return to London, however, that his gifts were diverted to sculpture, owing to the encouragement of his friend Charles Bell Birch, A.R.A., who was struck by Jones's remarkable anatomical knowledge of horses. Seymour Lucas also helped to influence his final adoption of sculpture as a profession. He first exhibited in the Royal Academy in 1884, with a study of one of his own hunters. For a good many years he exhibited regularly at the Royal Academy, the Grosvenor Gallery, the Royal Institute and the Paris Salon.

In 1934, Captain Adrian Jones was given the diploma of honorary associate of the Royal College of Veterinary Surgeons, and he was also an honorary member of the Incorporated Association of Architects and Surveyors. Of military and, in later life, rather rugged appearance, Jones was universally popular, not to say beloved, in art circles in Chelsea. A picturesque figure, he was rarely seen out without a flowing black cloak lined with scarlet, which he wore through the Abyssinian campaign, the Nile Expedition and the Boer War. "So much of my life is wrapped up in my cloak that I could never bear to part with it," he said. In the book of reminiscences to which we have alluded above, Adrian Jones gave an interesting account of his military experiences—in the Abyssinian War in particular, where he was one of the first to enter the hut where King Theodore had shot himself with a revolver given to him by Queen Victoria—and of his methods of work. In this connection *The Times* says: "He devoted far too much space to refuting a stupid accusation that he was not the author of one of his works. Similar accusations are not uncommon in the history of sculpture—Rodin, for example, was accused of exhibiting a cast from the living model—and nobody familiar with sculptural methods,

THE CAVALRY WAR MEMORIAL
(Stanhope Gate, Hyde Park)

and the necessary delegation of labour in the execution of large works, would think them worth more than a flat denial."

Captain Adrian Jones was twice married; in 1870 to Miss E. E. Bechingham, and in 1891 to Miss Emmie Wedlake, and had one son, Mr. Adrian Jones, the etcher. To those bereaved we extend deepest sympathy, in the name of the first profession to be adorned by him.

The funeral service was held yesterday (Friday) morning at Chelsea Old Church in the presence of a large and distinguished assembly which included many leading representatives of the arts and of veterinary science. Cremation followed at Golders Green.

* * * * *

Bushnell, Walter, The Grange, Mochdre, Denbighshire, Captain R.A.V.C. (T.A. Res.). Graduated N. Edinburgh, June 2nd, 1891. Died January 15th, 1938.

Mr. Bushnell was well known not only in Mochdre, but also in Conway and Deganwy, having practised his profession in each centre, where the news of his death was received with deep and widespread regret.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Feb. 3rd.—R.C.V.S. Council Election: Voting papers issued to overseas members. Meeting of the Central Division, N.V.M.A., at Conway Hall, W.C.1, 6.30 p.m.

Feb. 4th.—Meeting of the Sussex Division, N.V.M.A., at Brighton, 2.45 p.m.

Feb. 7th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 4 p.m.

Feb. 10th.—Annual General Meeting of the Lincolnshire and District Division, N.V.M.A., at Grantham, 2.30 p.m.

Feb. 16th.—Annual General Meeting of the Lancashire Division, N.V.M.A., at Liverpool, 2.30 p.m.

Aug. 21st-25th.—Thirteenth International Veterinary Congress, Zürich.

Aug. 26th-27th.—Thirteenth International Veterinary Congress, Interlaken.

Sept. 5th-9th.—Annual Congress, N.V.M.A., at Glasgow.

R.C.V.S. Council Election

Voting papers for the next R.C.V.S. Council Election, June 2nd, 1938, will be issued early in February to overseas members. There will be ten vacancies, the additional ones being caused by the death of Dr. O. Charnock Bradley, and the resignation of Mr. J. Willett.

The following is a list of nominations received to date:—

Brittlebank, Lieut.-Colonel J. W., Sawbridgeworth.
Coleman, J. C., Swindon.
Dawes, H. W., West Bromwich.
Glover, R. E., London.
Hare, Dr. T., St. Albans.
Livesey, G. H., London.
MacKenzie, A., Market Drayton.
Mulvey, Lieut.-Colonel W. S., Chelmsford.
Taylor, Major F. J., Oxford.
Walker, Colonel G. K., Abingdon.

* * * * *

PERSONAL

Birth.—Trevor.—On January 18th, 1938, at Llanover Lodge, Chepstow, Mon., to Betty (neé Greig), wife of S. Ll. Trevor, M.R.C.V.S., a son.

. . . . .

Will.—Fowle, Mr. Warwick, of Birkenhead, veterinary surgeon (net personalty £23,121), £60,344.

* * * * *

VICTORIA VETERINARY BENEVOLENT FUND —LADIES' GUILD

The dance organised by the Ladies' Guild in aid of the above fund was held at Princes Galleries, Piccadilly, London, on Friday, January 14th, and proved to be one of the most enjoyable functions yet organised by the Guild. It was held in the smaller hall which was judged by all those present to be much nicer than the large hall previously used—indeed it was so cosy and produced such a happy and intimate feeling that the function actually became a "party" instead of a formal dance.

The party was graced by the presence of the President of the R.C.V.S. and Mrs. Simpson, and over 100 members and their friends attended and voted it an enormous success from the point of view of real enjoyment. A little fear had been expressed as to the advisability of proceeding with the arrangements owing to the unfortunate illness of that most capable Honorary Secretary and organiser, Mrs. Nickinson, but the President (Mrs. J. B. Buxton) in conjunction with other members of the committee, notably Mrs. Wragg, Mrs. King and Mrs. Wooldridge, decided that it must go on, and right well were they rewarded.

Numerous prizes were generously provided by ladies of the committee for spot dances, etc., and Professor Buxton presented prizes for raffles and with Mrs. Wragg worked energetically in disposing of their tickets. Here unfortunately they had to fight without the valuable help usually given by Dr. Fred Bullock who was also absent through ill-health. Professor Buxton also generously provided the excellent band and

Professor G. H. Wooldridge officiated as Master of Ceremonies, assisted by Major G. W. Dunkin and Captain W. Wragg—the latter being especially detailed to look out for (?) gatecrashers and to exact the necessary toll.

No speeches were permitted but hearty cheers were given before the close for the President, Mrs. Buxton, who charmingly acknowledged them in a few well chosen words, and for Mrs. Nickinson who was away ill and Mrs. Wragg who so courageously stepped into the breach and carried out the final arrangements.

It is evident that a comparatively small attendance of a little over 100, however enthusiastic, could not have produced any substantial financial results and the committee are very grateful to those who supported their efforts by buying tickets even though they were unable to be there.

We are pleased to state that the dance realised about £46 10s. 0d. after the payment of all expenses. The tonic effect of this splendid result has reacted wonderfully on Mrs. Nickinson and Dr. Bullock and we are pleased to state that they are practically restored to normal health again.

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DEATHS OF RACEHORSES AT NEWMARKET

No Common Cause Discovered

A statement issued on January 20th by the solicitors to Mr. G. Wellesley, the trainer, makes it clear that there is no evidence that the horses dying recently in the Newmarket district suffered from any contagious or infectious condition and that no common cause for the deaths has been discovered.

The statement issued by William Easton and Sons, solicitors, of London Wall, E.C., is as follows:—

"In order to dispel the uneasiness felt by some thoroughbred owners and to counteract the exaggerated rumours which appear to have been spread during the past week, it seems desirable that some indication of the conclusions which have been reached concerning the deaths of certain horses in the Newmarket district should be given.

"Five horses have died in two separate establishments, showing similar but not identical symptoms of superpurgation, associated with fever, laboured pulse, and later pain and prostration. One horse, similarly affected, has recovered under treatment. Careful examination, both *ante-* and *post-mortem*, of various organs, body fluids, as well as water supplies, food, etc., has failed to reveal any common cause for these illnesses or deaths. No evidence whatever has been obtained to show that the horses suffered from any contagious or infectious condition. Certain detailed chemical analyses are not yet completed, but it can be stated that none of the common poisonous substances has been detected.

"In the opinion of our advisers there is no cause for alarm among owners of horses or trainers at Newmarket. With the exception of avoiding the use of any drastic purgative medicine, pending final conclusions, there is no necessity to take any special precautions beyond those which are part of the normal daily routine in any well-managed breeding or training establishment."

The four racehorses trained by Mr. Wellesley, at Newmarket, which died were Silver Crest, Whimsical Walker, a gelding by Haste Away out of Rosyth, and a filly by Tolgus out of Peria. The first horse to die was the Rosyth gelding on the Thursday before Christmas. The second died on Boxing Day, a third shortly afterwards, and Silver Crest on New Year's Day.

Some days later another horse died. This was Welltaken, a three-year-old filly trained by Captain Whitaker at the Sefton Lodge Stables, Newmarket, which are opposite Mr. Wellesley's stables.

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FOOT-AND-MOUTH DISEASE

On Wednesday of last week two cases of foot-and-mouth disease were reported on farms in Jersey. An official announcement was issued on Wednesday evening by the Jersey Agricultural Committee that the disease had broken out on a farm at St. Johns, a northern parish. A Standstill Order has now been issued and all cattle, pigs, sheep and goats, are to be carefully watched. All movement is prohibited until further orders.

The news came as a great blow to breeders as this month about 200 head of cattle were to be shipped abroad, buyers having visited the island and made their purchases.

"Island authorities have always been very keen on keeping clear of trouble; only this week a steamer was prohibited from calling at St. Malo (France) which had been declared an infected area," writes a correspondent to the *Farmer and Stockbreeder* of January 18th. "As there is not much movement of cattle on the island it is hoped to restrict the disease to the one farm.

"Jersey is practically self-governing and does not come under the Whitehall Veterinary Department. The Ministry has issued an Order prohibiting the landing of ruminant animals from the Channel Islands into this country. Hay and straw come under the same ban.

"There have been only 13 animals imported from Jersey since Christmas. These are being followed up by inspectors. Some are now at the landing place at Southampton and they will be detained.

"The farm where the outbreak occurred is in the north of the island. The cattle appeared on the last inspection by the owner and his workers to be in the best condition, and it was a great surprise to him to find one of the herd showing signs of ailing.

"Expert advice was sought and the illness was quickly diagnosed as foot-and-mouth disease. The animal affected was destroyed and this outbreak has led to twelve more beasts of excellent pedigree stock being killed.

"The outbreak may prove very damaging to Jersey farmers because the valuable heifers and bulls cannot be replaced. Nearly all the herds in the island are the progeny of world-famous sires."

. . . . .

Since the publication of our last issue, outbreaks of foot-and-mouth disease have been confirmed at Kelvedon (Essex), Stocksbridge, Yorkshire, Shedfield (Hampshire) and Broad Chalk—near Salisbury (Wiltshire), while it has been found necessary to extend into Gloucestershire the existing Dorset-Wiltshire "standstill order" to include areas affected by an outbreak near Chippenham.

Prayer for Deliverance

The Bishop of Salisbury has asked that in the churches of villages and market towns of Wiltshire and Dorset, prayer for the release of the countryside from the present outbreak of foot-and-mouth disease may be used. The prayer contains the petitions:—

"We beseech Thee to look upon our present distress and grievous loss through disease among the cattle. We pray that the measures taken to limit its diffusion and to free us from its deadly effects may bring a blessed deliverance; so that what remains unto us may be spared, and we may recover the fruits of our toil, on farm and in market."

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THE PNEUMATIC TYRE

A film showing how the pneumatic tyre came to be invented by J. B. Dunlop, a veterinary surgeon in Belfast, and the development from that small beginning of a rubber industry that now provides innumerable commodities in daily use and employment for many thousands of persons, has been prepared by the Dunlop Rubber Company to mark the fiftieth anniversary of the invention.

The film, which has the title *Jubilee*, was shown for the first time on Monday last at the rooms of the Royal Empire Society, Northumberland Avenue.

In it the testing of the first pneumatic tyre in 1888 is described, and there is a reconstruction of the Belfast Queen's College, Belfast, sports in May, 1889, when William Hume, of the Belfast Cruisers' Cycling Club, won the bicycle race with a pneumatic-tyred machine. The progress of the tyre-making industry, begun in Belfast, and transferred to the Midlands of England, where in 1916 Fort Dunlop was established, is shown, and there are scenes from the rubber plantations in Malaya. There is also shown the first aeroplane flight by the Wright Brothers, and flying demonstrations at Hendon in 1911, when Dunlop bicycle tyres were used on the wheels of aeroplanes. The latter part of the film illustrates the numerous uses to which rubber is put in present-day manufacture.

Mrs. J. McClintock, daughter of Mr. J. B. Dunlop, was among those present.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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MORTALITY AMONG YOUNG STOCK

To the Editor of the Veterinary Record

Sir,—Your editorial, "Mortality Among Young Stock," will be welcomed by many practitioners to-day and I can assure you, Sir, you do not over-estimate the seriousness of it, and that year by year things are growing worse. In your list of probable reasons I think you have omitted the greatest of all and that is food poisoning. The numbers of animals that are poisoned every day by feeding are appalling and this is just where we practitioners are helpless; we can get no assistance from either the analyst or the laboratory. Again and again after one or more analysts have sworn that a foodstuff is free from all injurious substances I have offered to supply the animals for a practical test, but in every case they refuse the challenge, knowing very well that if the matter comes into a law court the seller of the stuff can shelter under the analyst's report. I am often consulted by the animal feeding-stuff sellers, themselves; they are quite well aware of what is happening and are anxious to help all they can. Several of the firms are insuring against death by their own stuff. Of course this is a farce, as the owner has to produce an analyst's report stating the poison before he can claim, besides his veterinary surgeon's certificate. I do not agree that the complacency and what might be described as the fatalistic attitude of the farmer is a reason. I find, more often than not, that he is keen to probe to the bottom of things. Quite recently I spent £18 of a hard-working farmer's money in analyst's and laboratory fees trying to find out what had killed nine fat bullocks. Within the last ten days I have had three outbreaks of, so far, unsolved food poisoning: eleven strong store pigs dead out of a lot of 16; six fat 12 cwt. six toothed bullocks dead out of a lot of 24, and 20 pigs of various ages dead out of a lot of about 80. I diagnosed both lots of pigs as cases of cyanide poisoning, and those in the bullocks as cotton cake poisoning. I am afraid what looks to be apathy on the part of the owner is more often a want of confidence in veterinary surgeons to help him out of his troubles. If the Ministry, under the new scheme, can devise some method of assisting practitioners to cope with those difficulties we are meeting practically every day, then some good can be done for the stock-owner.

I am,
Yours faithfully,
Wm. A. Campbell.

Boroughbridge,
Yorks.
January 22nd, 1938.

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"HISTORY OF VETERINARY SCIENCE"

To the Editor of the Veterinary Record

Sir,—I read with great interest J. T. E.'s able review of Professor Leclainche's "History of Veterinary Science" in your issue of January 15th, 1938.

Apparently in this work a view is put forward that the teachings of Socrates and Christ, because of their emphasis on the supreme destiny of the human soul, have had a "baneful effect" on veterinary science.

Conversely, the curious position is taken up that Buddhist and Moslem teachings have been, or at least would have been, more favourable to its growth.

Is not one entitled, even in such a journal as this, to point out that the facts as known to those who have lived in the East do not help Professor Leclainche's views forward at all?

In practice the Eastern attitude towards animals does not seem to go much beyond the doctrine of "Ahimsa" or "not killing," often with results opposite to our ideas of humanity, let alone progress in veterinary science.

In the East, in fact, veterinary science is clearly a recent transplantation from the West where it has grown up in a soil saturated for centuries with teachings declared by Professor Leclainche to be harmful to it.

Yours faithfully,
A. T. Crowther.

"Hughenden,"
Sondes Road,
Deal.
January 23rd, 1938.